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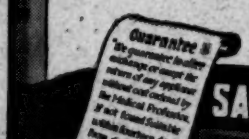

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LONDON SATURDAY JULY 17 1948

AGENTS DETERMINING AND INFLUENCING THE FUNCTIONS OF THE PARS NERVOSA OF THE PITUITARY*

BY

E. B. VERNEY, F.R.S., F.R.C.P.

Professor of Pharmacology, University of Cambridge

The pars nervosa of the pituitary is essentially the macroscopic representation of the multiple and terminal branching of axons most of which originate from the supraoptic nuclei. These nuclei are bilaterally placed in the ventral surface of the anterior part of the hypothalamus; each is separated into an anterior and posterior division by the emergence of the optic tract from the optic chiasma, and the axons stream thence, as the supraoptico-hypophysial tracts in the antero-ventral wall of the infundibulum, to their distribution in the pars nervosa. The structural entity comprising the nuclei, tracts, and pars nervosa is called the neurohypophysis. Extracts of the pars nervosa exhibit antidiuretic, oxytocic, and, under certain experimental conditions, pressor and diuretic properties, and I propose in this opening paper to confine consideration to the first of these by briefly reviewing the evidence which has led to the endowment of this pharmacological property with the significance of a physiological function.

Conditions Leading to Profuse Watery Diuresis

There are three conditions under which a profuse watery diuresis is observed, and in each instance the effect of posterior pituitary extract is to reduce the rate of water

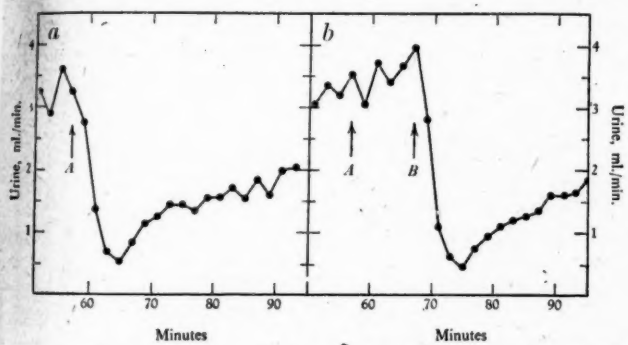

FIG. 1.—Inhibitory responses to intracarotid injection of hypertonic solution during water diuresis in the dog. *a*: at *A*, injection of 10.5 ml. of 1.50% NaCl into left carotid in 9 seconds. *b*: at *B*, injection of 11 ml. of 1.50% NaCl into right carotid in 13 seconds. Abscissae: time after the test dose of water.

output by the kidney and to increase the percentage of chloride in the urine. These conditions are, first, perfusion of the dog's kidney in the isolated state; secondly, experimental or pathological lesions of the neurohypophysis; and, thirdly, the administration by mouth of large volumes of water to the living mammal.

The effects of post-pituitary extract on the polyuria associated with the first condition are closely simulated by switching into the perfusion circuit, in parallel with the kidney, the head of a dog, the inhibition of diuresis and

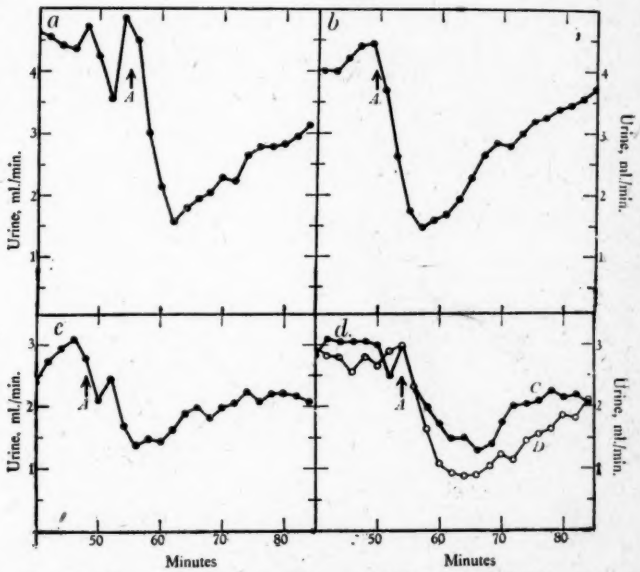

FIG. 2.—Responses to injections: *a* and *b* 5 days before, *c* and *d* 11 days after, removal of posterior lobe of pituitary. *a*: at *A*, injection of 21 ml. of 2.50% NaCl into right carotid in 20 seconds. *b*: at *A*, 1 mU of post-pituitary extract injected intravenously in 15 seconds. *c*: at *A*, injection of 21 ml. of 2.50% NaCl into right carotid in 20 seconds. *d*: at *A*, 0.1 mU (curve *C*) and 0.2 mU (curve *D*) post-pituitary extract injected intravenously in 20 seconds. Abscissae: time (approx.) after the test dose of water.

increased excretion of chloride being then dependent upon the presence of the pituitary in the perfused head; and these effects may occur without appreciable diminution of blood flow through the kidney at constant perfusion pressure. The view was put forward, therefore, that the phenomenon of profuse watery diuresis exhibited by the kidney perfused in the isolated state was due to the divorce of the kidney from the inhibitory influence of the antidiuretic substance elaborated in the pars nervosa.

This view has received strong support from observations made under the second of the conditions to which I have just referred—viz., experimental or pathological lesions of the neurohypophysis. The chequered aetiological history

*Read in opening a discussion in the Section of Pharmacology at the Annual Meeting of the British Medical Association, Cambridge, 1948.

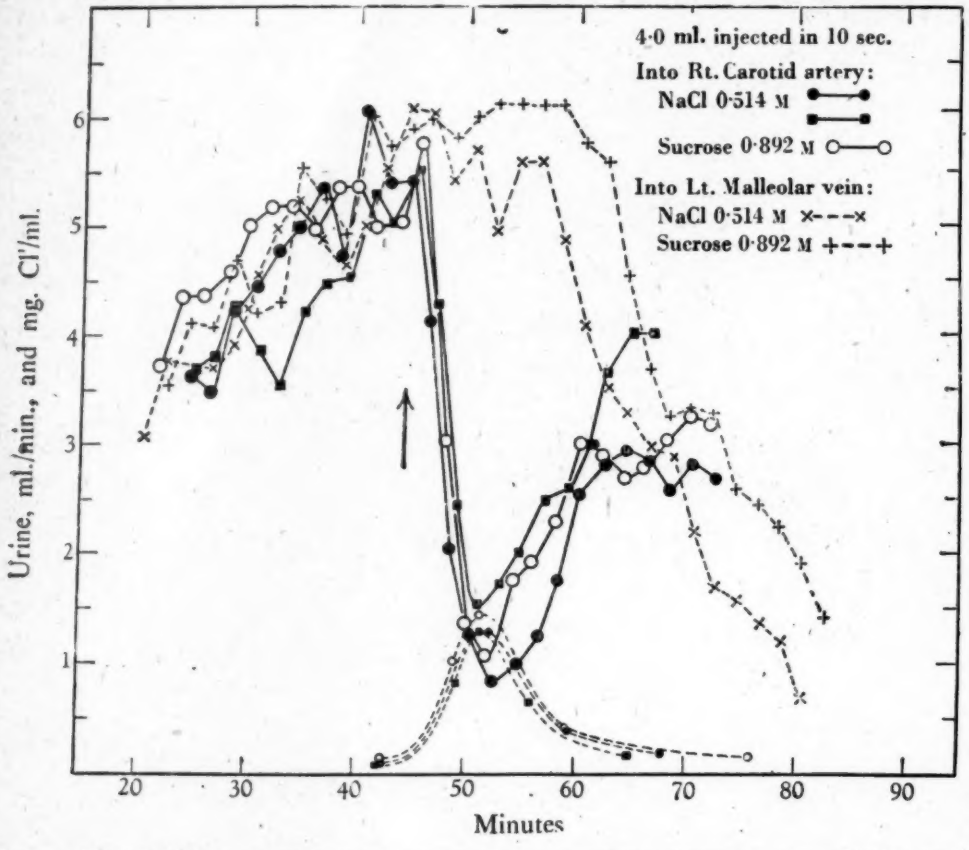

FIG 3.—The injections were made at the arrow. The corresponding changes in urine chloride are given by the curves at the bottom of the figure. Abscissae: time after the test dose of water.

of the diabetes insipidus associated with these has culminated in the elegant demonstration by Ranson and his colleagues that the occurrence of diabetes insipidus is contingent upon the complete or quasi-complete degeneration or removal of the neurohypophysis. Using the Horsley-Clarke stereotaxic instrument, they have been able to place small discrete lesions at any desired points in the hypothalamus, and to show that when by these means the supraoptico-hypophysial tracts are interrupted a series of striking degenerative changes takes place in the supraoptic nuclei and in the neural division of the hypophysis, the degeneration being associated with a fall of some 95% in antidiuretic activity as measured by comparative assays of extracts of the normal and of the atrophic pituitaries. The view, therefore, that diabetes insipidus derives essentially from a deficiency, complete or extreme, in the antidiuretic product of the neurohypophysis would appear, on the available evidence, to be incontrovertible.

The third condition under which a profuse watery diuresis appears is the administration of water by mouth to the living mammal, and the question arises whether this phenomenon, too, is of pituitary origin. When water is given by stomach-tube to the dog under conditions which, both externally and internally, are kept as constant as possible, the diuretic responses to successive doses are sufficiently uniform to allow analysis of the phenomenon's underlying events. That such responses are not so simply determined as appearance suggests is shown by the fact that the course of alimentary absorption is well in advance of that of renal excretion, there being in the dog, under certain experimental conditions, an interval of 15 minutes between the peak of the water-load—i.e., the proportion of absorbed but as yet unexcreted water—and the peak of diuresis. The significance of this interval will be considered later. The response of the innervated kidney runs strictly parallel with that of the denervated kidney, and the response is unaccompanied by any change in the volume flow of blood through the kidney.

Inhibition of Diuresis Response

Next, this diuresis response may be inhibited in various ways—for example, by subjecting the animal to short-lived muscular exercise or to emotional stress, and by intravenous injections of adrenaline or of post-pituitary extract. The inhibition produced by short periods of muscular exercise in the dog—e.g., running at 6 m.p.h. for 4 minutes—has been shown to be due to the emotional accompaniment of the exercise; and, since the inhibition from emotional stress was very much like that produced by an intravenous dose of post-pituitary extract, it seemed worth while to analyse the phenomenon with some care. The induced emotional disturbance need be a very small one, an unfamiliar and ugly sound being sometimes enough to elicit an inhibitory response. Usually, however, a weak faradic current carried to the subcutaneous tissues by surgically clean needle electrodes, as being a simpler and more controllable form of stimulus, has been used for the analysis of the resultant inhibition. From such analysis we now know that the inhibition of water diuresis by emotional stress is independent of the nerve supply to the kidney, is not caused by the endogenous release of adrenaline, is unaccompanied by any appreciable change in the volume flow of blood through the kidney, and is deferred by some two minutes from the time of the stimulus. The inhibition of water diuresis by the intravenous injection of post-pituitary extract likewise shows all these characteristics, and with a suitable dose of extract the response to the one agent is indistinguishable from that to the other.

So close a resemblance between the two responses, both in form and in measurable accompaniments and independencies, made one confident that removal of the posterior lobe of the pituitary would be followed by a big reduction in the inhibitory response to emotional stress. This was found experimentally to be so. There can, then, be little doubt that the stimulus produces the observed changes in the excretion of water and chloride by ultimate involvement of the supraoptic group of hypothalamic cytons whose axons pass down the stalk of the pars nervosa, and by whose activity the pituitary antidiuretic substance is released. Certain pharmacological agents, too, affect the functional activities of the neurohypophysis.

A Controlling Factor

The demonstration in the normal animal of the release of pituitary antidiuretic substance by the artificial means of faradic stimulation of sensory nerves and receptors, and the fact that this release may be caused by such mild disturbance of the central nervous system as comes within

a physiological range, encouraged an attempt to determine whether the secretion of this substance was not continuously varying with, and under the direct control of, some factor in the animal's internal environment, to the maintenance of which factor within a narrow physiological range the renal excretion of water and of chloride would specifically contribute. Such a factor is clearly the osmotic pressure of the arterial blood, and it became of interest to determine the effects of a rise in this pressure on the secretion of the kidney during water diuresis.

For this purpose dogs have been provided with carotid loops whereby injections or infusions may be made direct into the common carotid blood stream. While intracarotid injection of isotonic solution of sodium chloride and intravenous injection of hypertonic solutions are without apparent action on the course of water diuresis, intracarotid injection of hypertonic solutions causes definite inhibitory responses. They are illustrated in Fig. 1. The shape of these responses suggested that they were of pituitary origin, and this hypothesis was put to the test of experiment by measuring the response to a given injection before and after removal of the posterior lobe. Fig 2*a* gives the response to 21 ml. of 2.50% NaCl injected into the right carotid in 20 seconds, and we may note in passing that it equates closely with the response to 1 mU of post-pituitary extract injected intravenously (Fig. 2*b*). The response to the same intracarotid injection after removal of the posterior lobe is given in Fig. 2*c*: it is very much reduced in size. It is therefore a valid procedure to assay the responses in terms of post-pituitary extract; and when this is done it is found that the response to a given intracarotid injection is diminished by some 90% as the result of removal of the posterior lobe: Fig. 2*d* gives the response to an intravenous injection of 0.1 mU.

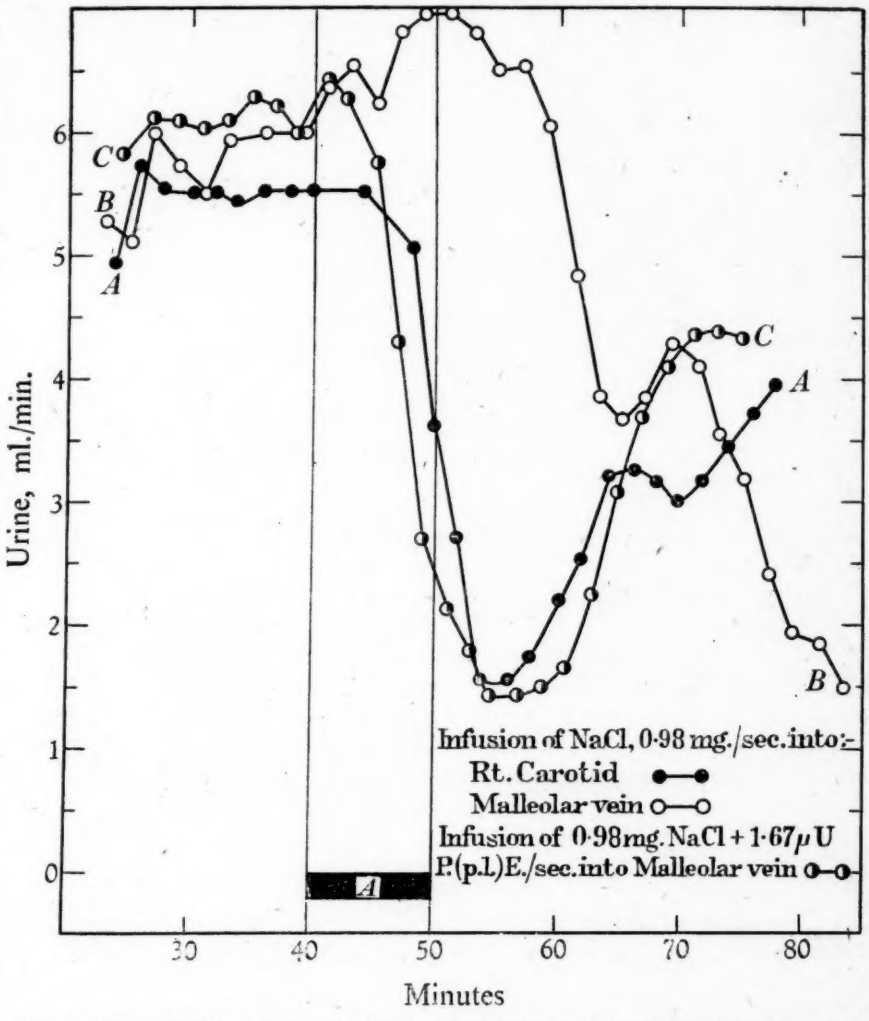

FIG. 4.—The rectangle *A* covers the period of the infusions. Abscissae: time (approx.) after the test dose of water.

Action of Sodium Chloride

It now became important to know whether the sodium chloride was acting specifically or by virtue of the increase which it produced in the osmotic pressure of the plasma. To this end equal increases in the osmotic pressure of the carotid blood were produced by injections of sodium chloride, sodium sulphate, dextrose, and urea. While the responses to sodium chloride and sodium sulphate were indistinguishable, the response to dextrose was seemingly a little smaller, suggesting that the osmotic effectiveness of dextrose was less than that of the other two solutes. Urea, on the other hand, was found to be quite inactive. A similar comparison was then made between the effects of osmotically identical injections of sodium chloride and sucrose. The results are given in Fig. 3. Three responses are shown: two of them (black circles and squares) are to the injection of the sodium chloride solution, and the third (open circles) is to the injection of the sucrose solution. The calculated percentage increases in the osmotic pressure of the carotid blood during the injections are 52 and 53 respectively. The response to sucrose lies between the two responses to sodium chloride. Moreover, the courses of the concentration of chloride in the urine (shown at the bottom of the figure) are identical. Seeing that the only common and equal change in property of the carotid blood caused by the injection of these two solutions is the increase in osmotic pressure, and that both produce quantitatively the same release of post-pituitary antidiuretic substance, the osmotic determination of the phenomenon is beyond cavil.

"Osmoreceptors"

It becomes justified, therefore, to introduce the term "osmoreceptors" as descriptive of the autonomic receptive elements with which the neurohypophysis is functionally linked and through whose activation the pituitary antidiuretic substance is released; and the facts so far presented show that when they are exposed to short-lived and large increases in the osmotic pressure of their environment their "membrane" is relatively impermeable to sodium chloride, sodium sulphate, and sucrose, less impermeable to dextrose, and freely permeable to urea.

Where, then, do these receptors lie? They are not in the carotid sinus nor in the carotid body. Comparison of the effects of like increases in the osmotic pressure of the common carotid blood before and after ligation of the internal carotid artery, however, has shown that such ligation virtually abolishes the response. The receptors lie, therefore, in the vascular bed normally supplied by the

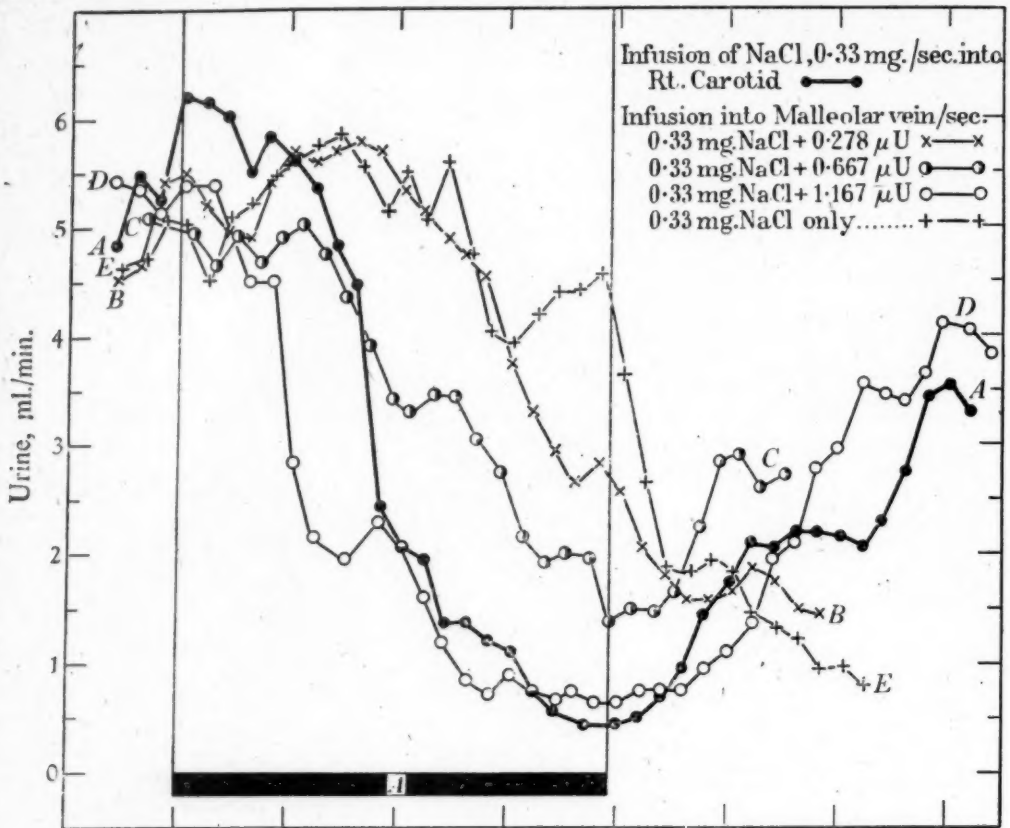

FIG. 5.—Effect of 40-minute infusion of NaCl into the carotid, and the method of its assay. The black rectangle covers the period of the infusions. With the intracarotid infusion the calculated local increase in osmotic pressure is 1.8%. Abscissae: time (approx.) after the test dose of water.

internal carotid artery. Their precise location and histological identification must be left to future experimentation.

So far we have been considering the responses of the osmoreceptors to short-period (10 to 20 seconds) and large (50 to 100%) increases in the osmotic pressure of their environment. It now became of interest to determine the effects of exposure of the receptors to much smaller increases maintained over longer periods. For this purpose intravascular infusions of various solutes have been made at uniform rates over periods of 10 and 40 minutes. It was found that when over a period of 10 minutes a hypertonic solution of sodium chloride was infused into a carotid the inhibition of urine flow occurred earlier than when the same infusion was made into the malleolar vein, and that as the strength of the infused solution was reduced this difference became greater. The cause of the earlier onset of the inhibition when the infusion was made into the carotid must be attributed to the increase in osmotic pressure of the internal carotid blood over and above that of the aortic blood.

This difference between the effects of intracarotid and intravenous infusions is illustrated in Fig. 4. During the 10-minute period shown by the black rectangle A sodium chloride was being introduced into the circulation at the rate of 1 mg./sec. The effect of this procedure on the course of the urine flow when the infusion was made into the right carotid is shown by the black circles, when into the malleolar vein by the open circles. The third curve (black-and-white circles) shows that the response to the intracarotid infusion is closely matched when to the intravenous infusion is added post-pituitary extract in such amount that 1.67 μU is being introduced into the circulation every second. The calculated local increase in osmotic pressure produced by the intracarotid infusion is 5.4%. Comparable experiments with sodium sulphate and with sucrose gave results which on assay were closely similar to those of the sodium chloride experiments. With dextrose, however, two striking differences appeared: there was a small response to the intravenous infusion; and the response to the intracarotid infusion, though larger than that to the intravenous, was definitely smaller than that to an osmotically equivalent infusion of sodium chloride. The osmoreceptors therefore are, under these conditions, at least partially permeable to dextrose.

Long-period Intracarotid Infusion

We come now to the effects of a much smaller increase in the osmotic pressure of the carotid blood maintained over a much longer period—viz., 40 minutes. The results obtained with infusions of sodium chloride at 0.33 mg./sec. are illustrated in Fig. 5. The black rectangle covers the period of the infusions. With the intracarotid infusion (curve *A*, black circles) the urine flow, after a latent period of some 10 minutes, begins to fall; eventually it reaches the low rate of 0.5 ml./min., at which level the flow is persisting when the infusion is stopped. The flow then slowly increases, to reach a rate of nearly 4 ml./min. thirty minutes later. The intravenous infusion (curve *E*), on the other hand, has no appreciable influence on the course of the diuresis. The calculated percentage increase in the osmotic pressure of the carotid blood during the intra-arterial infusion is 1.8, corresponding with a local increase in blood chloride of 9 mg./100 ml., and the experiment shows that under these conditions the "membrane" of the osmoreceptors maintains its relative or complete impermeability to sodium chloride for a period of at least 40 minutes.

In strictly comparable experiments with dextrose, however, no difference was detected between the effect of the intracarotid and that of the intravenous infusion. With the intracarotid infusion the local increase in blood dextrose responsible for the 1.8% increase in osmotic pressure is some 90 mg./100 ml.; the conclusion is justified, therefore, that the "membrane" of the osmoreceptors is permeable to dextrose to such degree that a maintained rise in blood dextrose of some 90 mg./100 ml.—a rise which, incidentally, is within the human pathological range—fails to elicit an antidiuretic secretory response by the neurohypophysis. Patients with diabetes mellitus are still permitted to be polyuric. When similar experiments were made with sucrose the results of the intracarotid infusions showed

close quantitative agreement with those obtained with sodium chloride. The assay of such response to sodium chloride is illustrated in Fig. 5. The response to the intracarotid infusion (black circles) lies for most of its course between the responses to 0.67 (black-and-white circles) and 1.17 (open circles) μU/sec., being nearer to and probably a little less than the latter: it is assayed as having a post-pituitary-extract equivalence of 1 μU/sec.

Conclusions from Results of Long-period Infusions

Three conclusions follow from the results of the 40-minute infusions. First, that increases in the osmotic pressure of the arterial blood—increases which, when large, were shown by the short-period injections to release post-pituitary antidiuretic substance—are still operative when they are reduced to values well within a range which may reasonably be regarded as physiological. An increase of only 1.8% in the osmotic pressure of the carotid blood gradually reduces the rate of urine flow from a water-diuresis maximum to the sort of rate which prevails at the beginning and end of a normal response to ingested water—i.e., a reduction of some 90%. The smallness of the osmotic pressure increase gains additional interest when it is recollected that the intracarotid infusions were unilateral. For if, as is probable, only half of the total number of osmoreceptors are being exposed under these conditions to the osmotic pressure increment, an increase of some 1% only (54 mm. Hg in absolute terms) in the osmotic pressure of the *aortic* blood would suffice to produce the same degree of inhibition of urine flow—i.e., a reduction to about 10% of the maximum rate of which the kidney is capable during water diuresis.

Secondly, the results of the 40-minute infusions demonstrate that the induced change in the osmotic pressure of the arterial blood which is responsible for this degree of reduction in urine flow itself causes the release of post-pituitary antidiuretic substance at an average rate of 1 μU/sec. (0.5×10^{-9} g./sec. in terms of the standard powder), this being the intermediating agency through which the change in osmotic pressure becomes effective.

Thirdly, the recovery of urine flow when the intracarotid infusion is stopped (Fig. 5) shows that the secretion of post-pituitary antidiuretic substance is now inhibited by the local fall in osmotic pressure and consequent depression of activity in the osmoreceptors, the progression of this recovery being attributable to the gradual destruction in the kidney, and maybe in the blood, of the quantity of antidiuretic substance which was maintaining the secretion of urine at a non-diuretic level. The latent period between the peak of the water-load curve and the maximum rate of urine secretion, to which I referred earlier and promised to return, is clearly to be attributed to the same process.

Water diuresis, then, is fitly and accurately described as a condition of physiological diabetes insipidus, and there can be little doubt that the antidiuretic secretion of the neurohypophysis is a hormone in the physiological sense that its liberation is mainly and continually governed by the contemporary concentration of sodium chloride in the carotid arterial plasma. The physiological fitness of this control is emphasized by its quantitative aspects, in that changes within the range and of the order of 1% in the osmotic pressure of the arterial blood lead, through the intermediation of the antidiuretic hormone, to changes in the rate of water excretion within the range and of the order of 1,000%: the maintenance of near constancy in the osmotic pressure of the internal environment is thereby achieved.

THE USE OF POST-PITUITARY EXTRACT IN PHYSIOLOGICAL AMOUNTS IN OBSTETRICS

A PRELIMINARY REPORT

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In 1895 Oliver and Schäfer reported that extracts made from the pituitary gland caused a rise of blood pressure in anaesthetized animals when injected intravenously. Three years later Howell (1898) demonstrated that their pressor activity was confined to the posterior lobe, and this was confirmed in the following year by Schäfer and Vincent. In 1901 Schäfer and Magnus reported that post-pituitary extract exerted both diuretic and antidiuretic activities, and it was not until 1915 that Konschegg and Schuster first demonstrated that in conscious animals only an antidiuretic response could be obtained. Dale, in 1906, was the first to draw attention to the fact that this extract stimulated uterine muscle, and this activity was confirmed in 1909 by Frankl-Hochwart and Fröhlich.

It is now generally accepted that post-pituitary extract contains two active principles: (*a*) a pressor which is identical with the antidiuretic activity, and (*b*) an oxytocic substance. Both principles are destroyed by heat, tryptic digestion, hydrochloric acid decomposition, and alkaline hydrolysis, and both are of approximately the same molecular size. Further, in the most purified extracts the pressor and oxytocic activities remain in the same proportions as in an ordinary post-pituitary extract. It was for these reasons that for many years controversy raged on whether post-pituitary extract contained one or more active principles, and it was not until 1928 that Kamm *et al.* settled the dispute by separating and concentrating two active principles in the form of potent solid preparations.

In 1925 a Committee of the League of Nations adopted the U.S.P. Standard Reference Powder as the international standard, 0.5 mg. of this powder being equivalent to one international unit. The international standard preparation of the post-pituitary gland is simply a powder made from the whole posterior lobes of cattle, collected immediately after death and ground in acetone in order to remove water and fat. The different standard powders may therefore differ somewhat in activity, but it is unlikely that the discrepancy ever exceeds 20% in either direction.† Until 1928 post-pituitary extracts were standardized for their oxytocic activity by a method devised by Dale and Laidlaw in 1912, but the separation of two distinct principles by Kamm *et al.* suggested the desirability of devising a separate method for assaying the pressor activity of these extracts.

Blair Bell was the first to use post-pituitary extract in obstetric practice, and in 1909 he reported its efficacy in the treatment of post-partum haemorrhage and intestinal atony. It is of interest to note that before this date no clinical application of

*Mr. Gange terminated his appointment as resident obstetric officer at the end of December, 1947.

†We are greatly indebted to the Director of the Department of Biological Standards, the National Institute for Medical Research, Hampstead, for the above information.

post-pituitary extract had been made other than to prescribe tablets by mouth for their supposed diuretic activity. Two years later Hofbauer (1911) suggested its use in the treatment of uterine inertia. In 1927 Bourne and Burn concluded "that valuable application of a dose of 2 units can be made in cases in which labour is prolonged owing to sluggish pains provided that in primiparae dilatation is nearing completion." There is still, however, a widespread fear, based on unfortunate happenings, of using post-pituitary extracts until labour is completed. Reid (1946) and Eastman (1947) have recently advocated the use of small amounts of post-pituitary extract in cases of prolonged labour. Reid advocates starting with one minim (0.06 ml.) and increasing the dosage to not more than five minims (0.3 ml.), whereas Eastman is more cautious and starts with a half-minim (0.03 ml.), and never gives more than one minim. Both authors consider it wise to confine this method of treatment to obstetrically normal primigravidae whose progress in labour is tedious.

In 1931 Burn described a method of estimating the antidiuretic activity of post-pituitary extract by injecting it subcutaneously into a number of rats. This method was accurate within certain limits, but the subcutaneous route of injection introduced unknown, incalculable, and avoidable errors. Using the method described by Klisiecki *et al.* (1933), one of us (Theobald, 1934a, 1934b) showed that the intravenous injection of from 0.0005 to 0.01 unit of "infundin"* inhibited water diuresis not only in the dog but also in man, and in women during the last few weeks of pregnancy. The amount of antidiuretic activity necessary to inhibit water diuresis was remarkably constant for each dog, and the water diuresis curves thus inhibited, obtained over a period of several months, could be almost superimposed. Later in the same year Bentz, Marx, and Schneider (1934) and Stehle (1934) also showed that very small amounts of post-pituitary extract, when injected intravenously, inhibited water diuresis in the dog.

Two conclusions may be drawn from these results. The first is that, contrary to the observation of Kamm *et al.*, the antidiuretic activity affords the most delicate and possibly the most accurate method of assaying post-pituitary activity. The second is that the post-pituitary gland elaborates the two active substances in remarkably constant proportions (a fact observed by many workers), for it will be noted that infundin is standardized for its oxytocic activity. It was for this reason that it has always seemed to us logical to assume that the normal physiological oxytocic responses in the body are effected by an amount of the oxytocic principle of the same order as that of the antidiuretic principle which inhibits water diuresis.

For the same reasons one of us has postulated (Theobald, 1934b) that the post-pituitary gland does not elaborate a pressor principle, but that the antidiuretic principle, when injected intravenously in many thousand times its physiologically effective amount, happens to exert a transient pressor effect. Further, several observers have reported that post-pituitary extract constricts the coronary vessels, while Leschke (1919) has stated that it causes sino-auricular block, and these concomitant effects can hardly be regarded as desirable or likely to accompany the activity of a physiological pressor substance. We are not aware that Verney has specifically stated that it is illogical to assume that Nature would provide the same substance both to elevate the blood pressure and to inhibit water diuresis, when it is evident that many thousand times the amount adequate for the one activity is required to effect the other, but it is clearly implicit in his writings (Verney, 1947).

Clinical Observations

We have addressed ourselves to two main problems: (1) the induction of labour, and (2) the stimulation of uterine pains in cases of uterine inertia.

The procedure was as follows: Either 9 or 19 ml. of 5% glucose-saline was placed in a small sterile bowl, and to it 1 ml. of "pituitrin"† was added and stirred. The requisite amount of this mixture was then added to a standard bottle containing 500 ml. of a 5% glucose-saline solution prepared for intravenous injection. The dilutions of the pituitrin drip we have used have been 1 in 2,500, 1 in 5,000, and 1 in 10,000. Whereas for some months we used the 1 in 2,500 solution almost exclusively, we now prefer either the 1 in 5,000 or the 1 in 10,000 solution. It may be that the ideal lies in between the last two strengths. There is some reason to believe that the 1 in 2,500 solution occasionally causes irregularity of the foetal heart. In addition to the pituitrin we have sometimes added quinine bihydrochloride 2 gr. (0.13 g.), carbachol 25 mg., and 100–200 mg. of pethidine to the bottle of glucose-saline. The drip was set up in the ordinary manner, using a vein in either the arm or leg, and the infusion was begun at a standard rate of 40 drops to the minute. This rate was decreased if the pains became too strong or too frequent, and was occasionally increased. Not more than three bottles were given on any one day, but the drip was often discontinued and restarted on the following day.

Induction of Labour

It was felt that if a safe, efficient, and reasonably rapid method of inducing labour at any time during the last three weeks of pregnancy could be devised it would be of distinct value in obstetrics. It can be stated that, so far, the pituitrin drip, even when quinine and carbachol were added, proved a quite unreliable method of terminating pregnancy, and failed more often than it succeeded.

We found that the most effective single method of inducing labour was to sweep the membranes from that part of the lower uterine segment immediately above the internal os uteri with the finger and to touch this denuded area lightly with the silver stick. Labour supervened within 24 hours in the first 11 cases, but subsequent experience showed that the method was not always successful.

The routine to which we adhere at present is composite. In the first instance, four doses of quinine sulphate 10 gr. (0.65 g.) are given at four-hourly intervals. Two ounces (57 ml.) of castor oil are given either just before or just after the third dose of quinine. A copious warm enema is administered approximately four hours after the castor oil. If the woman does not go into labour within 24 hours from the time that the quinine induction is completed the membranes are ruptured at a point immediately below the presenting part. Should she not go into labour during the next 24 hours the pituitrin drip is started.

During the first three months of this year 43 patients were subjected to this method of induction of labour. Twenty-two went into labour within 24 hours of the completion of the quinine therapy; the membranes were ruptured in 20 cases; and the pituitrin drip was administered in 9 cases. In one of these the pituitrin drip was given 24 hours after the completion of the quinine therapy. The membranes of this patient were not ruptured, because she showed a marked degree of pelvic contraction. All the infants, save one, a breech delivery, were born alive and survived. One of us (G. W. T.) has used the quinine method of induction in hundreds of cases; we are satisfied that it is a safe way to induce labour, and it is successful in between 50 and 60% of all cases at term. The intervals between the administration of quinine must not be less than four hours, and the drug must be withheld once uterine contractions begin. In our experience any other form of medical induction is comparatively unsuccessful.

Only two patients caused anxiety, and they were both elderly obese multigravidae. Subsequent labour was in each case associated with marked uterine inertia. One was a 5-gravida, aged 35, with hypertension, who had not been pregnant for some years and was overdue; the other was a 6-gravida, aged 45, whose first pregnancy had terminated by caesarean section and whose youngest child was 6 years old. In each case delivery was effected by a difficult forceps extraction. The infant of the former patient died as the result of cerebral haemorrhage.

A number of patients were admitted after spontaneous rupture of the membranes. In our experience labour may be delayed subsequent to the rupture of the membranes for as many as eight days, and this delay may be associated with intrauterine death of the foetus. In these cases a pituitrin drip, containing in addition quinine hydrochloride 2 gr. (0.13 g.) in

*A commercial preparation of post-pituitary extract made by Messrs. Burroughs, Wellcome and Co., and standardized for its oxytocic content.

†A commercial preparation of post-pituitary extract made by Messrs. Parke, Davis and Co., and standardized for its oxytocic content.

each bottle of glucose-saline solution, is set up. The drip is taken down after two or three bottles have been administered and recommenced next day. Whereas the drip may have no apparent effect on the first day, it usually happens that uterine contractions occur within one to ten minutes of restarting the drip on the following day.

It is our practice to rupture the membranes whenever possible in the treatment of placenta praevia and to apply a tight binder. In three recent cases labour did not supervene within the course of the next 20 hours, so the pituitrin-quinine drip was begun. In one case labour pains started almost immediately, while in the other two it had to be repeated next day. All these babies were born alive and well.

Primary Uterine Inertia

We first treated cases of primary uterine inertia by the pituitrin drip method in June, 1947, and propose to report the results obtained in 20 consecutive cases treated during the last 5 months. Only one of these patients had previously given birth to a full-term living child *per vias naturales*, and she was a 5-gravida. Two had previously been delivered by caesarean section, and one had had two miscarriages and a premature infant which had died. Of the 20 patients four were aged 40 years or over and nine were over 30 years (three being 38 years old). In nine cases the head was free above the brim, and in only four was the head fully engaged. One was a breech presentation. After "trial labours" two were delivered by caesarean section. Nine patients were delivered by the forceps, and the remaining nine delivered themselves spontaneously. One baby died from a tentorial tear. The largest infant weighed 9 lb. (4.08 kg.), and the average weight was 7 lb. 6 oz. (3.34 kg.).

Case Reports

Case 1: Placenta Praevia.—D.M., aged 23; 1-gravida; term. *Nov. 16, 1947:*—Admitted because of ante-partum haemorrhage; not in labour. *Nov. 17:*—7 p.m.: Cervix two fingers dilated; marginal placenta praevia; membranes ruptured; Willett's forceps applied to control bleeding. 9.30 p.m.: Weak pains at five-minute intervals. *Nov. 18:*—1 a.m.: Weak pains every 15 minutes. 3 a.m.: No pains. 9.30 a.m.: Still no pains. 10.10 a.m.: Pituitrin 1 in 2,500 + quinine 2 gr. (0.13 g.) drip begun. 10.20 a.m.: Slight short pain. 10.30 a.m.: Moderate pains every three minutes; drip stopped; 1/3 pint (190 ml.) given. 12.40 p.m.: Cervix fully dilated. 1.30 p.m.: Delivery of living female child weighing 7 lb. 8 oz. (3.4 kg.). 1.48 p.m.: Placenta and membranes expelled complete.

Case 2: Induction of Labour.—E.H., aged 23; 2-gravida; term; previous elective classical caesarean section for contracted pelvis associated with transverse lie. *Sept. 30, 1947:*—12.30 a.m.: Membranes ruptured. 1 a.m.: Admitted to hospital; transverse lie; no pains; draining liquor amnii; lie changed to vertex by external manipulation; pads and binder applied. 7 p.m.: Still no pains—head free; pituitrin 1 in 2,500 + quinine 2 gr. drip. 7.45 p.m.: Vague pains—one every 20 minutes. 9 p.m.: Moderate pains every five minutes; head engaging. 10 p.m.: Second bottle started. 11 p.m.: Head on perineum; drip discontinued. *Oct. 1:*—1.17 a.m.: Spontaneous delivery of living male child weighing 6 lb. 7 oz. (2.92 kg.).

Case 3: Induction of Labour.—A.S., aged 31; 1-gravida. *June 8, 1947:*—11 a.m.: Membranes ruptured. *June 9:*—7 p.m.: Admitted to hospital; no pains. 8 p.m.: Head engaging; os two fingers dilated; B.P. 130/70 mm. Hg. 8.35 p.m.: 1 in 5,000 pituitrin drip started (30 drops a minute). 11.35 p.m.: Pains every 5 minutes—fairly strong; os two fingers dilated; drip slowed to 20 drops a minute; pot. brom. and chloral hydrate āā 30 gr. (2 g.). *June 10:*—1.15 a.m.: Os fully dilated. 2.10 a.m.: Spontaneous delivery of living female child, 6 lb. 5 oz. (2.86 kg.).

Case 4: Induction of Labour; Uterine Inertia.—M.H., aged 40; 1-gravida; 38 weeks. *Sept. 8, 1947:*—Admitted with hypertension. *Sept. 17:*—11.50 a.m.: Pituitrin 1 in 2,500 + quinine 2 gr. drip started (three bottles given). *Sept. 18:*—5.30 p.m.: Pains began. 6.30 p.m.: Membranes ruptured. 7.10 p.m.: Moderate pains every 10 minutes; head engaged; os two fingers dilated. 8.40 p.m.: Pains every four minutes—strong; os two to three fingers dilated; pethidine 150 mg. and hyoscine 1/100 gr. (0.65 mg.) given. 10 p.m.: Sleeping. *Sept. 19:* 12.40 a.m.: Strong pains every three minutes; no progress. 11.20 a.m.: Still no progress. 1.15 p.m.: Pituitrin 1 in 5,000 + quinine 1 gr. (65 mg.) drip started; B.P. 155/110 mm. Hg. 2.35 p.m.: Needle out of vein; drip discontinued; indefinite pains. 4 p.m.: Second bottle of pituitrin+quinine drip started. 5 p.m.: Moderate pains every four minutes. 6 p.m.: Mild rigor. 6.40 p.m.: Strong pains every four minutes. 8.30 p.m.: Strong pains every four minutes; os three to four fingers dilated. 10.50 p.m.: Only rim of cervix palpated; pethidine 100 mg. given. *Sept. 20:*—5.20 a.m.: Forceps delivery of living female child 7 lb. 10 oz. (3.46 kg.).

Case 5: Induction of Labour; Uterine Inertia.—C.G., aged 21; 1-gravida. *Nov. 26, 1947:*—Membranes ruptured spontaneously during the night. *Nov. 27:*—5.15 p.m.: Admitted to hospital. *Nov. 28:*—10 a.m.: No pains; no obvious loss of liquor amnii. 3.50 p.m.: Draining much liquor amnii; no pains. 9.5 p.m.: Foetal heart 120, irregular; no pains. 11.10 p.m.; Pituitrin 1 in 2,500 + quinine 2 gr. drip started. 11.15 p.m.: B.P. 104/60 mm. Hg; no pains. *Nov. 29:*—12.10 a.m.; no pains. 12.40 a.m.: Pot. brom. and chloral hydrate āā 30 gr. (2 g.) given. 1 a.m.: Second bottle of pituitrin drip started. 2.45 a.m.: Weak pains every 10 minutes. 3.30 a.m.: Third bottle started. 5.10 a.m.: Drip discontinued; foetal heart 120, regular; castor oil 2 oz. (57 ml.) given, followed four hours later by enema. 10.10 a.m.: Fairly strong pains every five minutes; head free; os one finger dilated. 2.10 p.m.: Moderate pains every 10 minutes; head free. 7.35 p.m.: Pelvis contracted, but no obvious disproportion; pot. brom. and chloral hydrate āā 30 gr. given. *Nov. 30:*—12.15 a.m.: Weak pains; pot. brom. and chloral hydrate āā 30 gr. repeated at 2 a.m. 10.50 a.m.: Slept well; no pains; head still free; liquor amnii blood-stained. 11.45 a.m.: Pituitrin 1 in 2,500 + quinine 2 gr. drip started; B.P. 104/60 mm. Hg; pains started immediately; uterine spasm; drip slowed for 10 minutes. 12.15 p.m.: Strong pains every three minutes; foetal heart rate 136. 12.45 p.m.: Needle out of vein. 1.45 p.m.: Drip restarted; head engaging; os two fingers dilated. 2 p.m.: Strong pains every three minutes; pot. brom. and chloral hydrate āā 30 gr. 2.20 p.m.: Pethidine 100 mg. and hyoscine 1/150 gr. (0.433 mg.) given. 3.45 p.m.: Well sedated. 6.15 p.m.: Third bottle started; strong pains every three minutes; head still palpable above brim. 6.30 p.m.: Drip discontinued. 7 p.m.: Head showing at vulva. 7.10 p.m.: Spontaneous delivery of living female child, 6 lb. 1 oz. (2.75 kg.).

Case 6: Uterine Inertia.—A.B., aged 43; 5-gravida; 39 weeks. *Feb. 14, 1948:*—5.10 a.m.: Membranes ruptured. 12 midnight: Labour started. *Feb. 15:*—6 a.m.: Admitted to hospital; head free; cervix closed; pains moderate. *Feb. 16:*—10 a.m.: Head entering pelvic inlet; cervix one finger dilated; pains weak. 4.30 p.m.: Pains stronger, every two to three minutes. 5.15 p.m.: Cervix one finger dilated; morphine 1/4 gr. (16 mg.), scopolamine 1/100 gr. (0.65 mg.), nembutal 1½ gr. (0.1 g.). 6.15 p.m.: Pituitrin drip 1 in 10,000 begun; B.P. 108/80 mm. Hg. 6.55 p.m.: Pains stronger. 8 p.m.: Pains strong; cervix two fingers dilated; B.P. 110/80 mm. Hg. 10 p.m.: Pains strong; head descending; cervix 3/4 dilated; drip stopped. 10.45 p.m.: Precipitate delivery of living child.

Case 7: Uterine Inertia; Incision of Cervix.—L.S., aged 31; 1-gravida; term. *Nov. 20, 1947:*—Admitted at 9.30 p.m. from a nursing-home with history of having started labour at 9 p.m. on Nov. 16 and membranes having ruptured at 5 a.m. on Nov. 17. On admission the head was well engaged; os one finger dilated; B.P. 145/100 mm. Hg. Morphine 1/4 gr. was given immediately. *Nov. 21:*—7 a.m.: Irregular pains at approximately ten-minute intervals. 2.30 p.m.: Moderately strong pains every three minutes; pethidine 100 mg. 3.30 p.m.: Pethidine 100 mg. 8 p.m.: Strong pains every five minutes. 11.45 p.m.: Pethidine 200 mg. given. 12 midnight: Pituitrin 1 in 2,500 + quinine 2 gr. drip started; B.P. 140/100 mm. Hg. *Nov. 22:*—12.45 a.m.: Pains every seven minutes; B.P. 140/100 mm. Hg. 2 a.m.: Strong pains every five minutes. 2.5 a.m.: Pethidine 100 mg. given. 4 a.m.: Pains still strong; no change in position of head; os two fingers dilated. 9.30 a.m.: Drip discontinued. 11 a.m.: Has slept well since 5 a.m.; condition good. 1.20 p.m.: Cervix incised and living female child weighing 8 lb. (3.63 kg.) delivered with forceps. Post-partum haemorrhage controlled with ergometrine.

This patient was in labour for nearly six days, and although the cervix became thinned out, it failed to become more than half dilated in spite of fairly good pains.

Case 8: Uterine Inertia.—M.L., aged 38; 1-gravida; term. *Jan. 9, 1948:*—11.30 p.m.: Admitted to hospital, membranes having ruptured. *Jan. 10:*—12 noon: Vague uterine contractions; head free; cervix closed. 5 p.m.: Pains as they were; os one finger dilated; head just tipped. 6.45 p.m.: Pituitrin 1 in 2,500 + quinine 4 gr. (0.26 g.) started; B.P. 150/110 mm. Hg. 7.45 p.m.: Patient vomited profusely; weak contractions every five minutes; head descending; os almost two fingers dilated. 10 p.m.: Continuous backache; contractions as before; head advancing; os three fingers dilated; pethidine 100 mg. given. 11.15 p.m.: Drip discontinued; one bottle given; morphine 1/4 gr., hyoscine 1/100 gr. given; slept well most of night. *Jan. 11:*—12 noon: Vague uterine contractions; slight backache; B.P. 150/110 mm. Hg; os three fingers dilated. 12.15 p.m.: Pituitrin 1 in 2,500 + quinine 2 gr. drip restarted. 2.15 p.m.: Weak contractions every five minutes; head in mid-cavity; os three fingers dilated; B.P. 150/90 mm. Hg. 3.30 p.m.: Second bottle begun; pains every ten minutes; B.P. 170/110

mm. Hg; os three to four fingers dilated; head in same position. 5.30 p.m.: Strong contractions every five minutes; B.P. 140/90 mm. Hg; os 3/4 dilated; pethidine 100 mg. given. 8.30 p.m.: Strong contractions every five minutes; rim of cervix only palpated anteriorly; pethidine 100 mg. given. 9.30 p.m.: Third bottle begun; B.P. 140/90 mm. Hg; general condition good. *Jan. 12:*—6 a.m.: Still small rim of cervix anteriorly; pethidine 100 mg. given; slept well. 11.30 a.m.: Second stage begun. 2.12 p.m.: Forceps delivery of living female child, 9 lb. (4.08 kg.).

Case 9: Uterine Inertia.—M.F., aged 20; 1-gravida; 41 weeks. *Sept. 15, 1947:*—5 a.m.: Pains started. 6 a.m.: Admitted to hospital. 9.40 a.m.: Pains irregular; membranes intact; head engaging; os one finger dilated. 4.30 p.m.: Weak pains every 20 minutes; membranes intact; no progress. 11.30 p.m.: Pot. brom. and chloral hydrate āā 30 gr. *Sept. 16:*—10 a.m.: Pains stronger—every six minutes; head engaged; os one finger dilated. 2 p.m.: Pains fairly strong; no progress. 5 p.m.: No progress; pains weak; pituitrin + quinine 2 gr. + pethidine 150 mg. drip. 5.55 p.m.: Pains stronger—every 5 minutes. 7.30 p.m.: Os two fingers dilated. 8.45 p.m.: Pains strong; os three fingers dilated; pethidine 100 mg. 8.55 p.m.: Second bottle started. 10.33 p.m.: Spontaneous delivery of a living male child, 7 lb. 11 oz. (3.49 kg.).

Discussion

The pituitrin drip may cause no uterine contractions if the woman is not in labour, and on the other hand may cause strong uterine contractions within five minutes, even within one minute, of its commencement. We have come to the conclusion that a 1 in 2,500 solution is too strong, and that the optimum dilution possibly lies between 1 in 5,000 and 1 in 10,000 of the post-pituitary extract. Kamm *et al.* (1928) stated that they had prepared post-pituitary extracts having an oxytocic activity 150 times greater than that of the standard powder, and later writers have made similar claims (Stehle and Fraser, 1935; Du Vigneaud *et al.*, 1933). None of these authors claims to have isolated the oxytocic principle in pure form, so that it is reasonable to assume that the post-pituitary oxytocic principle possesses an oxytocic activity at least 150 times greater than that of the international standard powder. Let it therefore be assumed (*a*) that the post-pituitary gland elaborates an oxytocic principle at least 150 times more potent than that of the standard powder; (*b*) that the average pregnant woman possesses three litres of blood plasma; (*c*) that none of the oxytocic activity becomes adsorbed to the red blood corpuscles; and (*d*) that labour pains do not start until after the drip has been running for five minutes, during which time $\frac{200}{17}$, or 12 ml., of the drip has entered the blood stream: it would then follow that a concentration of the oxytocic principle in the blood plasma not exceeding 1 in $\frac{10{,}000}{12} \times 3{,}000 \times 150 = 1 : 375 \times 10^6$ may suffice to initiate or to stimulate uterine pains.

In those cases in which spontaneous rupture of the membranes occurs before the onset of labour we consider it desirable to add 2 gr. of quinine hydrochloride to each bottle of glucose-saline solution in addition to the post-pituitary extract. If uterine contractions do not occur it is probably desirable to take down the drip after two bottles have been given and to restart it on the following day. In such cases it often happens that strong pains occur immediately the drip is recommenced.

The pituitrin drip does not cause a woman suffering from uterine inertia to have very strong pains, but it does in almost every case increase both the frequency and the intensity of the pains. An elderly primigravida may be in labour for three days and longer without any advance of the presenting part and without any dilatation of the external os. The pains, although ineffective, suffice to exhaust her. Morphine and other drugs potent enough to afford the woman adequate rest tend to put her "out of labour." The pituitrin drip is invaluable in such cases and makes possible the use of morphine and pethidine, for the drip can be continued while the patient is adequately narcotized. If we had to choose between the narcotic drugs and the pituitrin drip we should unhesitatingly choose the former, but we believe the drip to be a very valuable aid in the treatment of these peculiarly difficult cases.

The uterus apparently relaxes completely between the pains stimulated by the pituitrin drip. Slight irregularities in the foetal heart were noted occasionally, particularly when the 1 in 2,500 pituitrin drip was used. In such cases the drip was slowed. No permanent adverse effects on the foetus were observed. We consider it perfectly safe to use the pituitrin drip in cases of contracted pelvis when the head is not engaged, in cases of hypertension, and in cases of placenta praevia. It will be seen that Case 2 was previously delivered by a classical caesarean section. We no longer consider it safe to allow such patients to undergo trial labour, and for this reason we regard it as unsafe to administer the pituitrin drip to such cases. We know of no other contraindication to the use of the pituitrin drip provided it is thought desirable to stimulate the uterine pains.

Schockaert and Lambillon (1937) showed that the intravenous injection of "tonephin" (a post-pituitary pressor preparation) caused a higher and more prolonged rise in the blood pressure of patients suffering from "pre-eclamptic toxaemia" than in normal pregnant women, and these findings have been confirmed by de Valera and Kellar (1938) and by Browne (1944). The pituitrin drip causes no elevation of the blood pressure in normal patients, but a rise is sometimes detected in patients suffering from hypertension (see Case 9). The elevation is usually temporary, and strictly similar rises have been noted when a 1 in 10,000 dilution of "pitocin" * was used. We propose in a subsequent paper to discuss this matter more fully, to record the antidiuretic effects, and to reproduce kymographic tracings of the uterine contractions caused by the pituitrin drip.

Summary

A dilution of the oxytocic principle of post-pituitary extract in the blood plasma of an order not exceeding $1 : 375 \times 10^6$ is capable both of initiating and of augmenting labour pains in man. This dilution is comparable to that of the antidiuretic principle which suffices to inhibit water diuresis. This evidence makes it increasingly difficult to believe that the post-pituitary gland is normally concerned either with regulating or with elevating the blood pressure.

The use of the pituitrin-quinine drip is of great value in those cases in which the woman fails to go into labour subsequent to the rupture of the membranes, whether spontaneously or as the result of surgical intervention.

The pituitrin drip increases both the frequency and the intensity of the uterine pains in cases of uterine inertia and makes possible the adequate use of sedative drugs in the conduct of the labour.

The pituitrin drip may be used in all cases in which it is considered desirable and safe to stimulate the uterine pains, and it is immaterial whether the woman is a primigravida or a multigravida, whether or not she suffers from hypertension, or whether the head is above the brim.

It is not impossible that it will be found advantageous to apply the pituitrin drip to a wider range of cases. It is also possible that it will find a place in the third stage of labour, particularly in those cases of severe post-partum haemorrhage in which the placenta is retained. The pituitrin would of course be added to the transfused blood.

We have in the majority of cases used pituitrin, but pitocin would appear to be equally efficacious, and it would perhaps be more logical to use the latter preparation, particularly in those cases which manifest hypertension.

*A commercial preparation of the oxytocic principle of the post-pituitary gland prepared by Messrs. Parke, Davis and Co.

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SUBTOTAL COLECTOMY AND COLECTOMY IN ULCERATIVE COLITIS

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The treatment of ulcerative colitis in this country has always been regarded as medical. Like most Australian surgeons, we have had little experience of the surgical treatment of this condition because patients suffering from ulcerative colitis are only referred for surgical treatment as a last resource. In three metropolitan hospitals over a ten-year period, the Royal Melbourne (in this hospital the ten-year period did not include the last two years), the Alfred, and St. Vincent's, 341 patients suffering from ulcerative colitis were admitted. Of these, 87 died and 23 were treated surgically (in one hospital 3 cases, in another 5, and in a third 15). There were 6 cases of appendicostomy, 6 of ileostomy, 5 of colostomy, 1 of ileosigmoidostomy, 1 of ileocolostomy, and 1 of colectomy. Of the 6 patients subjected to enterostomy 5 died.*

From these figures we may infer that in Victoria the incidence of ulcerative colitis is material; that its treatment has been mostly medical and has not been very successful; and that what little surgical treatment has been practised has not been of much value. This paper is founded on a relatively small series of cases, but they were desperate ones, and the later cases reflect team work by the authors—a necessary method of work in this critical surgery which demands painstaking and scientific preparation, often synchronous operating, small bedside operations, skilful post-operative methods, and constant surgical attention. Our interest in the radical surgical treatment of this condition was awakened by a particularly bad case which came under our notice (H.B.D.) in 1941.

Case 1.—A woman aged 34, who had been ill for six months with obscure abdominal symptoms, a progressive secondary anaemia, and some disturbance of her bowel function, became acutely ill with severe abdominal pain. She was operated on in the belief that she had an acute appendicitis; the appendix appeared acutely inflamed. About a week after the operation she began to have frequent and painful bowel actions and to pass large quantities of blood with some pus. It was apparent that she had a fulminating ulcerative colitis. Sigmoidoscopy confirmed this diagnosis and showed that the rectum was also badly affected. Notwithstanding many blood transfusions and every kind of treatment she steadily got worse until she was emaciated, cachectic, exhausted, and almost moribund.

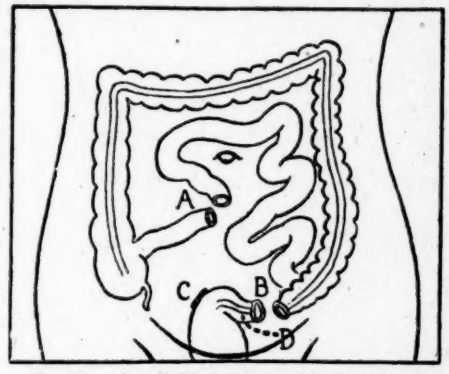

FIG. 1.—A=divided ileum; B=divided sigmoid; C=some mobilization of rectum; D=some prolapse of peritoneum of anterior abdominal wall around the sigmoid remnant so that when the bowel-ends are being closed the size of the sigmoid remnant can be reduced by amputation.

Conservative surgical measures such as appendicostomy or enterostomy could offer little hope of cure and she was too weak to stand a colectomy. We decided therefore on a "piecemeal" surgical approach, each successive step in treatment being designed not only to bring about improvement but also to be a stage in the removal of the colon. (*a*) An enterostomy was so planned that it was a step in the formation of an ileorectostomy (Figs. 1 and 2). (*b*) About five weeks later the ileum was connected to the rectum by the use of a special spur-clamp (Fig. 3) and the open ends of the bowel taking part in the anastomosis were closed under local anaesthesia (Figs. 4 and 5). (*c*) The colon, now isolated, with both ends open forming two mucous fistulae, was completely out of action and was treated by routine chemotherapy over a period of months until the patient ceased to improve. Since she had no discharging enterostomy and was comparatively comfortable, the length of this period was immaterial and we could wait almost any time (in this case eight months) till we felt that she was thoroughly

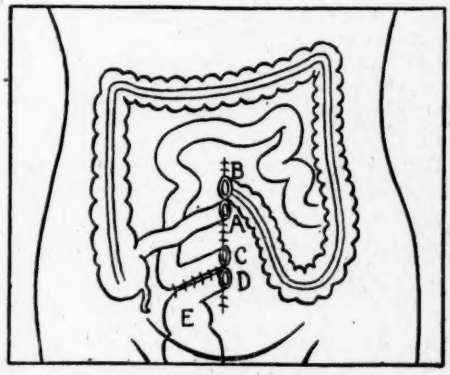

FIG. 2.—A=distal end of the ileum; B=distal sigmoid; C and D show the ileosigmoid spur made up of proximal end of ileum and distal end of sigmoid; E=rectum.

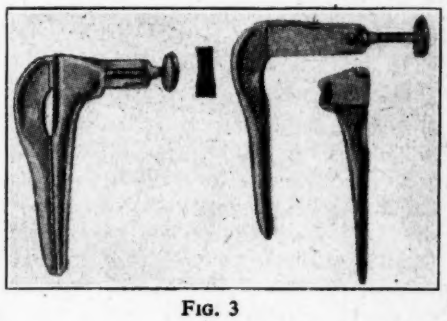

FIG. 3

*For this information we acknowledge our indebtedness to Dr. George Gunther, of the Royal Melbourne Hospital, Dr. Smibert, of the Alfred Hospital, and Dr. Carl DeGruchy, of St. Vincent's Hospital, who kindly collected it; and to the respective hospitals for their generous permission to publish the figures.

fit for the last stage—namely, (*d*) a colectomy (or near-colectomy), which in this instance was done in one stage after a period of painstaking preparation.

Main Principles

Certain main principles should govern this surgical procedure. (1) A very careful preparation to correct hypoproteinaemia and anaemia. (2) A graduated method so that when the colon is removed there is no sudden dislocation of function. (3) No stage should be undertaken until the patient's condition justifies it. (4) No intra-abdominal sutures must be used in the infected, rigid, greatly thickened colon—thus the cut ends of the bowel must be closed extraperitoneally. The anastomosis of the ileum with the rectum must be made without sutures—that is, with a specially constructed enterotome in which the edges are so generously bevelled that the rigid friable tissue is subjected to a gradual pressure and broad adhesions in the edges of the anastomosis are brought about; a straight-edged clamp would cut through the brittle tissue. The rectum is mobilized upwards and a small segment of the lowest part of the sigmoid is preserved so that this spur-clamp (Fig. 3) can be used.

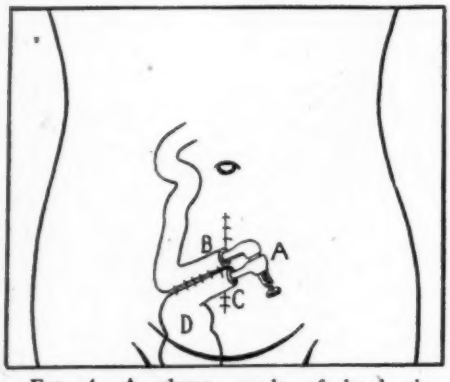

FIG. 4.—A=clamp, made of hard aluminium alloy, in position to crush the spur; B=ileum; C=sigmoid; D=rectum.

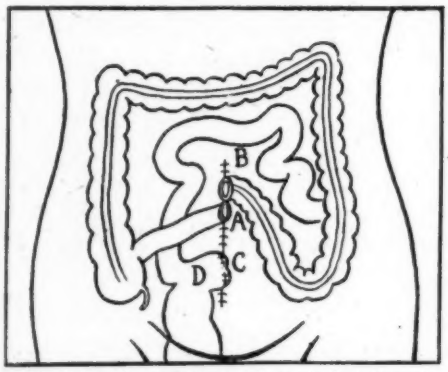

FIG. 5.—A=openings of excluded bowel; B=ileum; C=closed ends of the ileum; D=lower segment of the sigmoid.

In Case 1 when the resected colon was examined it was found to be 2 ft. 9 in. (84 cm.) long and uniformly affected with an advanced stage of acute ulcerative colitis. In the ileocaecal region there was a group of very large inflamed glands; nowhere else were the glands enlarged to any extent. The patient began to improve soon after the ileum was connected to the rectum. For eight months while her isolated colon was washed out with sulphonamide solutions her general condition improved steadily and she became much heavier and began to look well. There was, however, little improvement in the colon; an examination showed little or no improvement in the condition of the mucous membrane and pus poured from the mucous fistulae in large quantities. Then her general condition ceased to improve and this determined the time for her colectomy. This operation caused her little disturbance. The isolated colon was much retracted and much smaller than normal and was thus comparatively easy to remove. Four months after her colectomy she began to improve rapidly. The badly diseased rectum began gradually to clear up. A few tiny ulcers formed in the ileum, but these soon disappeared. This patient is now, six years later, a red-faced, healthy-looking person; she is 4 stone (25.4 kg.) heavier and has no signs of active disease in her rectum. Her bowels open six to eight times a day and twice at night. (This is unusually frequent, as we shall see from later cases.) She has, however, a group of inflammatory glands which can be felt in the left iliac fossa and which on *x*-ray seem to be well away from the rectal anastomosis.

Case 2.—A man of 54 had suffered from a severe ulcerative colitis for three years. He had hourly motions, had lost a lot of weight, had become cachectic, was unable to work, and was very sick indeed. *X*-ray and sigmoidoscopic examination showed that extensive and irreparable structural changes had taken place in the bowel. A modified enterostomy as described in Case 1 (Fig. 1), the first stage of the subtotal colectomy, was done (H.B.D.). His general condition began to improve, but the repair of his abdominal wound was weak and a superficial mild but spreading ulceration formed around the enterostomy. Then about two months after his ileum had been connected to his rectum strangulation of a loop of bowel occurred under a band-like section of ileum which was attached to the anterior abdominal wall. He recovered from the operation, but died some months later from bronchopneumonia.

This case was a failure. He never derived much benefit from his enterostomy, never improved enough to enable us to proceed with the stages of his colectomy, and never had a healthy-looking abdominal wound. Deficient tissue vitality as shown by lack of repair in his enterostomy wound and by his terminal bronchopneumonia was probably the direct result of an intense toxaemia and of protein loss from the large ulcerating surface. Careful pre-operative measures to counteract his hypoproteinaemia had never been properly carried out.

Case 3.—This patient was in just as desperate a condition as Case 1. He had been sick for four years. He had ten or more motions a day and several at night, with copious blood and pus. He weighed 7 stone (44.5 kg.) and looked like a person in the last stages of tuberculosis.

This patient was operated on (H.B.D.) in much the same way as Case 1. When examined after removal the colon was over 3 ft. (91 cm.) long and showed a late stage of the disease involving the whole colon. After the colectomy there was a dramatic improvement and in 12 months the patient was able to do light work.

Two years after the colectomy he developed an acute intestinal obstruction. An operation (J.B.D.) relieved this. Now, three years after his operation, he appears to be quite well, has been back at full work for one year, and is 5 stone (31.8 kg.) heavier. The number of his motions has gradually diminished till now he has two in the day—one in the morning and one before going to bed. He says, "The motions are not formed, but they are not liquid; they are softish." The tip of a finger introduced into the rectum enters the ileum. Sigmoidoscopy shows that the disease in his rectum has completely cleared up.

Four More Cases

Case 4.—A woman of 43 was very wasted, acutely ill (pulse 130), and looked as if she would only live a month. For 18 months she had had all the symptoms and signs of a very severe ulcerative colitis in which the rectum was also involved. She had weeks of intensive preparation before any operation could be considered. With a great struggle she got through her first-stage operation carried out as in Case 1. She was so sick that the periods between the operative steps had to be long. Her tissues had very poor vitality; a slab of tissue in the abdominal wall, lying over the anastomosis with the rectum, came away as a large slough. After each operation she improved, until finally we were able to remove her colon. The colon was white and opaque-looking, greatly thickened, oedematous, and uniformly involved. The appendix was in two parts, the division lying in the midst of evidences of a past abscess.

Two years later this patient was comparatively well. She had gained much weight and was doing her own housework.

The rectal condition was almost normal. She had six stools in 24 hours—four during the day, two during the night. A sinus still remained in the lower part of the abdominal scar where the slough had occurred.

Case 5.—A young man of 22 had had a very severe ulcerative colitis of two years' duration; he had spent six months in hospital. He received the usual careful pre-operative preparation with a view to correcting haemoglobin and protein deficiency. Immediately after the first stage of his surgical treatment—that is, after the modified enterostomy (H,B.D.)—he became painlessly distended, and notwithstanding Miller-Abbott therapy, jejunostomy, and every possible measure, including abdominal exploration (J.B.D.), he died of what we regarded as a paralytic ileus.

Case 6.—This patient reached a stage of almost complete cure and then died from an adventitious cause. He was 60 and had suffered from a bad ulcerative colitis for two years. The colon was removed in the way already described (H.B.D.). Following the operation his condition improved, and reports two years later indicated that he was comparatively well. About this time a report reached us that he had died suddenly up-country from an acute intestinal obstruction (no operation).

Case 7.—This woman of 37 had had an ulcerative colitis for 20 years and had been under my care (H.B.D.) for that time. In its early stages the colitis had been very severe for three years and she had been practically bedridden. In an effort to help her a valvular appendicostomy was made and into this we inserted an indwelling catheter (H.B.D.), which never leaked. Through this she gave herself a daily wash-out, and after a time she became well enough to earn her living.

Years later there was an exacerbation of the disease, and finally a stricture formed in the lower 3 in. (7.5 cm.) of her sigmoid. This became so narrow that surgical treatment was imperative. Accordingly her colon was removed by the "sliding-scale" method already described (H. B. D. and J.B.D.). Since the stricture was in the lowest 3 in. of sigmoid it could be included in the spur. Thus, with the distal cut end of the sigmoid opening on to the abdominal wall, the stricture could be so dilated as to permit the introduction of the enterotome, so that when the spur was crushed it was divided (Fig. 6) and the stricture became part of the anastomosis.

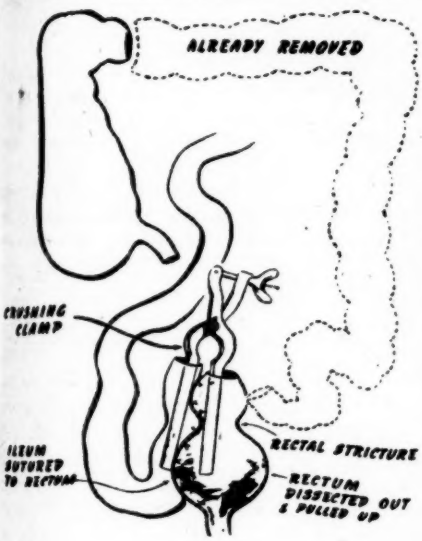

FIG. 6

Two and a half years after the operation this patient has greatly improved. Her colour has completely changed and she looks healthy; she has increased greatly in weight, is able to do full work and to defaecate comfortably. The number of her motions has become less and less until now they are four a day and none at night. Sigmoidoscopy shows that the disease in the rectum has almost cleared up; the signs of inflammation are gone and there is much scarring, but there still remains one small ulcer.

Possibilities of Surgery

The next case was a good example of what surgery can do for ulcerative colitis. It concerned a distressing and pitiable case of four years' duration in a 19-year-old girl. In the early stages of her illness a properly constructed enterostomy had been done. For twelve months after this she continued to improve, but then began to relapse rather badly and soon became very ill indeed. Although her condition was desperate we felt justified in facing up to a colectomy because of her youth. The most favourable time for operation, when the patient had derived the greatest benefit from the enterostomy, had long passed. Her general condition was very bad. Her tissues had almost lost the power of repair; a small wound in the abdominal wall had not healed in nine months There were fistulae from the rectum into the vagina, and there was a stricture in the rectosigmoid region. The disease in the rectum was so advanced that it was obvious that this organ was irrecoverable.

Case 8.—Special care was taken in her pre-operative preparation. Blood and serum to correct her anaemia and hypoproteinaemia were given well before the operation so as to get their full effect. At operation (H.B.D. and J.B.D.) it was seen that while the distal colon was severely affected the proximal colon showed no evidence of the disease. The disease was so advanced as to preclude the possibility of the colon ever functioning normally; there was a perforation in the sigmoid, and it was obvious that the rectum would eventually have to be removed.

In this case we thought it wise to take advantage of the absence of disease in the proximal colon to preserve the ascending colon, as it would provide a more controllable artificial anus than would the terminal ileum (the wisdom of this was subsequently proved). The colon was resected from the hepatic flexure to a point about 3 in. (7.5 cm.) above the rectosigmoid junction. The cut end of the distal segment of the sigmoid was implanted in the lower end of the wound, the peritoneum of the anterior abdominal wall being stripped and well prolapsed into the abdominal cavity round the stump so as to leave as small a segment of sigmoid as possible. A small, carefully constructed artificial anus, which could be controlled, was made at the hepatic flexure. At a second operation the enterostomy was closed. The wound, however, showed little tendency to heal.

For about nine months her general health continued to improve, after which she was again so ill that it looked as if she would surely die. We were faced with a most adverse set of circumstances: a profound deterioration of general health and of all her bodily functions; wounds from the previous operation which had not yet completely healed; and spreading areas of cellulitis in various parts of her body. Nevertheless, because she was only 19, we decided to operate.

She was first given several blood transfusions. Later, under nitrous oxide anaesthesia (Dr. Travers), with two sets of instruments and two nursing teams—one for the abdominal surgeon (H.B.D.) and one for the perineal surgeon (J.B.D.)—the rectum was removed in just over the half-hour with astonishingly little disturbance to the patient. Penicillin was used as dressing in the large infected cavity left after the rectum was removed.

Her general condition began to improve very slowly, but for many months the rectal cavity showed no sign of healing. Finally a stage was reached when it began to heal very slowly; it was well over 12 months before it had closed.

Now, over three years later, she seems to have completely recovered. She looks perfectly healthy, has gained stones in weight, is able to ride and to drive a car, and carries out nursing duties for her father, who is a doctor. What is most gratifying is that, thanks perhaps to the fact that she has her ileocaecal valve, or that a small part of her colon was left to make the artificial anus, she has a practical control of her bowel. She gives herself a wash-out through the colostomy once a week, and until her next wash-out her abdominal wall is never soiled. This is unusual, but is cited to show the value of preserving the proximal part of the colon. That a patient as ill as this girl was could survive removal of most of her colon and the whole of her rectum, and could get so well that she could lead a normal life, has

made us revise our surgical philosophy in so far as it applies to the treatment of desperate cases of ulcerative colitis.

In this case we see some traits of the worst form of the disease: the intractable type of ulcerative colitis; the specific deficiency in tissue repair; the general dissemination of the infection as seen by the areas of cellulitis; and the greater incidence of the disease in the distal colon and particularly in the rectum. In it, too, we see the temporary value of enterostomy; the powers of recovery of youth in a desperate case of ulcerative colitis; the importance of taking advantage of an unaffected caecum and ascending colon; and the fact that in this case after all that was done to her she is able to live practically a normal life.

Partial Colectomy

Another case showed how a partial colectomy may help in some patients. A man of 57 had had an ulcerative colitis for 20 years. He was cachectic, emaciated, and dehydrated. He had been having motions, mostly of pus and blood, 12 or more times a day and three or four at night. About 18 months before coming into hospital he had begun to have attacks which were diagnosed as due to chronic intestinal obstruction. A 3-in. (7.5-cm.) stricture in the middle of the transverse colon and another but shorter one in the rectosigmoid region could be seen in a radiograph. A long, hard, nodular tumour, which was undoubtedly malignant, could be felt in the region of the transverse colon corresponding to the site of the stricture.

Case 9.—At operation (H.B.D.) a long sausage-shaped malignant growth was found occupying the greater part of the transverse colon. The walls of his chronically inflamed colon were about 1/4 in. (6 mm.) thick, rigid, and friable. To suture such a colon would be impossible. Here it was obvious that the only way to effect an anastomosis was to make a spur and use a bevelled-edged enterotome so as to crush by graduated pressure rather than cut through the rigid and friable tissue. The hepatic flexure and the adjoining part of the ascending colon, the transverse colon, the splenic flexure, the descending colon, and the upper half of the sigmoid were stripped from the posterior abdominal wall as one large segment. The limbs consisting of mobilized ascending colon and hepatic flexure and mobilized descending colon and sigmoid were sutured together to form a spur. The tumour-containing segment was then widely amputated. Later the spur was crushed by the gradual application of a bevelled-edged enterotome. The patient recovered and for three years enjoyed a comparatively comfortable life.

The lesson to be learnt from this case is that extensive partial colectomy—subtotal colectomy—has a value in the surgical treatment of ulcerative colitis. So much of his diseased colon was removed that the toxic effects of, and the miseries attendant on, the inflamed and ulcerated colon were greatly ameliorated. This patient died three years later following an attempt to remove the rectosigmoid stricture, which appeared also to have become malignant.

Low Stricture of the Rectum

The next case had a special interest in that it showed how a fairly low stricture of the rectum could be dealt with.

A girl aged 19 had had ulcerative colitis for six years. Sigmoidoscopy showed that the rectum and sigmoid were almost completely denuded of mucosa; there was a foul, frothy, semi-purulent discharge. A radiograph showed absence of haustration, rigidity of the bowel, and loss of the mucosal pattern as far as the splenic flexure. The remaining colon had a normal appearance. The patient looked very sick and had a haemoglobin of 65% on the 14-gramme standard.

Case 10.—As the disease was confined to the descending colon, sigmoid, and rectum, a transverse "defunctioning" colostomy was done in August, 1946 (J.B.D.), under gas and ether anaesthesia. The idea was that as the patient was a young girl the question of resecting the distal part of the colon and making an anastomosis between a long proximal part of the transverse colon and the rectum should be considered if the "defunctioning" colostomy did not bring about healing of the disease. Following this operation, the patient improved and her weight increased by half a stone (3.2 kg.).

By March, 1947, she was again having almost continual rectal bleeding and her general health was no longer improving. She now had a stricture 2 in. (5 cm.) from the anus through which the tip of the examining finger could not be passed. So at the Alfred Hospital under gas, oxygen, and ether anaesthesia a midline lower abdominal incision was made and the rectum was dissected free to within 1/2 in. (1.25 cm.) of the anus. The ileum was then transected and its acting loop brought down and sutured alongside the rectum as low in the pelvis and as near to the anus as possible. A spur was thus created with ileum going to below the stricture, and the end of the rectosigmoid stump was also implanted in the wound. At the same time the colon was removed from the rectosigmoid junction region as far as the transverse colostomy.

Six days after the operation a crushing clamp was applied as shown in Fig. 6, and the stricture was crushed into the ileum. Thus a free passage of ileal contents into the rectum was assured. At a later date, under thiopentone, the acting loop of the ileum and the rectosigmoid stump opening on to the abdominal wall were closed. The specimen removed was 3½ ft. (105 cm.) long, and showed considerable fibrosis and much loss of mucosa. Following this operation the patient had put on weight and had become engaged to be married. She was having two bowel motions in the 24 hours.

Sigmoidoscopy before she left hospital revealed improvement of the disease in the rectal pouch, which had previously been markedly involved. There was a wide opening between the ileum and rectum. Three or four months later, by which time she was in every way a normal girl, sigmoidoscopy failed to reveal any disease in the rectum. It was now thought advisable to remove the isolated segment of ileum and caecum and ascending colon. This was done and she progressed favourably until the tenth day, when she developed a subphrenic abscess. The abscess was drained surgically below the twelfth rib. Drainage ceased in about a fortnight, and the next stage of her progress was uneventful except for the slow healing-over of a fistula from the ileo-rectal anastomosis which was inadvertently opened at the preceding operation.

Our last patient (Case 11), aged 55, was a woman who had suffered from diarrhoea, often having 15 motions in each 24 hours, and loss of weight. She had become very depressed and the disease had reached a late stage. The first stage of the operation (the junction of the ileum to the rectum and closing the ileo-rectal fistula) was carried out. The patient has been sent home where she can live comfortably, having only a slight mucous discharge from the two mucous fistulae. She can do her own work, so there is no hardship in her remaining any length of time, so long as she continues to improve, before the final stage, a colectomy, is carried out. This case is included to show the comfortable life that patients can lead while waiting for their colectomy, and also because we feel that it is in the first-stage operation that the danger lies.

Future Policy

Although our series is small it includes such bad cases and good results that we feel we are entitled to build from it a surgical philosophy for our future treatment of ulcerative colitis. We believe, first, that a case of established ulcerative colitis should come to a surgical consultation early in its course to consider the question of early operation from the following viewpoints:

(*a*) Can the surgeon help the physician? He may be able to do so by making a non-leaking valvular appendicostomy (in Case 7 such an appendicostomy functioned for about 18 years without leaking).

(*b*) There is some justification for the removal of the appendix, since it is not above suspicion as the point of entry of the infective element in the colitis.

(*c*) To find out early in the course of the disease whether the ascending colon is free from the disease, because in this case the prognosis is much brighter and early operation is justifiable.

(*d*) To ascertain the type and severity of the ulcerative colitis with a view to planning its treatment. Is it a case which medical treatment will not cure? I think this judgment can be made.

Secondly, we should advise in treatment more attention to tissue resistance and tissue repair. They probably play a larger part in this infective disease than does the virulence of the organism.

Thirdly, we should regard ulcerative colitis in much the same way as we do gastric ulcer; that is, when ulceration and loss of substance of the mucosa have taken place and the physician is making no headway with his treatment we should advise operation with a view to removing the colon, and advise operation early.

We believe that the reward of early colectomy or subtotal colectomy is a low immediate mortality and a very fair chance that the rectum will recover when the colon is removed. We feel it is not wise to wait on and on in the hope of medical cure.

Summary

Here were 11 advanced and desperate cases of ulcerative colitis for which a policy of careful radical surgery was planned. In general, it represents a rather timid and tedious method of operation, but both the immediate and remote results are more than satisfactory. We look forward to the application of the method to much earlier and less debilitated cases—to cases which from our experience we can say will not be cured by medical treatment.

Of the 11 patients two died. One died of an adynamic ileus immediately following the first-stage modified enterostomy, and one three months after the first stage from tissue deficiency and toxaemia. None of the patients died following colectomy or excision of the rectum. Thus, of 11 desperately sick patients, six survived subtotal or near-colectomy, one a near-colectomy combined with excision of the rectum, one a partial colectomy involving two-thirds of the colon, and one the first stage of colectomy.

Six patients seem to be cured—the worst case of all for six years. They have no bowel discomfort and live normal lives. One patient has only two motions a day and none at night. Most of the patients, however, have from four to five motions in 24 hours.

The Minister of Health recently held a valedictory reception for members of the Rushcliffe Nurses and Midwives Salaries Committees and members of the Advisory Council of the Civil Nursing Reserve, which were disbanded on July 5. The two Rushcliffe Committees worked almost continuously for nearly seven years and have reviewed the pay and conditions in every field of nursing. Their reports and recommendations have covered all grades of nurses, both men and women, in all branches of the hospital and public health field, as well as the midwifery service. In 1941, for example, a hospital staff nurse received £70–£80 a year; to-day as a result of the Rushcliffe recommendations she receives £140–£200 a year. With the coming into operation of the National Health Service there will be entirely new machinery for dealing with salaries and conditions of service. There is to be a series of Whitley Councils covering all those working in the Service, and one of these will be for nurses and midwives. The Minister of Health paid tribute to the great work of Lord Rushcliffe and the members of his Committees and of the C.N.R. Advisory Council. Lord Rushcliffe in reply said that during a long period in public life nothing had given him greater satisfaction than his association with the Nurses and Midwives Salaries Committees. Their recommendations had not been pigeon-holed but had shown prompt results.

DEATH FROM INHIBITION, AND ITS RELATION TO SHOCK

A CRITICAL SURVEY

BY

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Among medico-legal experts there is apparent a certain confusion in describing the nature of death from inhibition, and often also between the effects of shock and of inhibition. This is especially so when they are dealing with cases which might fall within either category, and regarding which they have to decide in one way or the other and to present a logical and scientific conclusion to the courts. The medico-legal expert cannot afford to use vague expressions and nomenclature. The pathologist, on the other hand, is not usually subjected to such difficulties and can afford to express opinions that are not necessarily binding; he is at liberty to advance hypotheses which are liable to modification or alteration but which can be so altered without serious consequences.

I propose to draw attention to the manner in which various writers on pathology and legal medicine deal with these matters and other related subjects of special medico-legal interest. We find, for example, in certain medico-legal textbooks special attention given to death due to inhibition with almost entire neglect of the subject of shock, while the exact opposite occurs in some of the books on pathology. Both sides may have their own reasons for this selective handling of their own subject. For instance, the medico-legal expert may contend that shock does not interest him greatly because usually it is possible to attribute the cause of death directly to the injuries so obviously and extensively present—severe trauma such as rupture of viscera, extensive burns, or severe haemorrhages. On the other hand the pathologist may contend that death due to inhibition has no material meaning to him so long as he cannot find microscopic or macroscopic evidence of direct pathological processes which he can hold responsible for the death. Thus both parties appear to be relatively satisfied with the present position in regard to both subjects.

Elsewhere in the literature of forensic medicine and trauma we find an obvious confusion between these two subjects, the terms "inhibition" and "shock" being used loosely and incorrectly as if they were interchangeable—a state of things that is perhaps attributable to recent activity in the study of shock and the frequency with which the subject is referred to in medical periodicals. The fact that shock has become extensively written about seems to have had as a consequence the effect of confusing the two syndromes.

Very few among the leading authorities in forensic medicine, pathology, or physiology deal with the difference between the two subjects with sufficient emphasis, and then only to put death due to inhibition under the title of primary shock while speaking of shock as "delayed shock"—an attitude which has served only to increase the confusion.

I shall endeavour to put forward the real facts concerning the nature and mechanism of both syndromes and of the other phenomena, related to quite different causes, which are ordinarily confused with death due to inhibition.

What is Inhibition, and How Does it Result in Death?

The term was first used after the discovery by the Weber brothers in 1846 that the excitation of the vagus along its course and irritation of its peripheral end after section give rise to a marked slowing of the heart's action, and that when the excitation is strong enough it may lead to the stoppage of the heart in diastole—i.e., to a complete inhibition of its action.

In 1856 Pflüger established the possibility of inhibiting the intestinal movements as a result of excitation of the ends of the splanchnic nerves. A few years later, in 1861, Rosenthal succeeded in inhibiting the respiration by exciting the vagus centrally. Since then many other workers have proved that this inhibitory action is not limited to the excitation of the main nerve trunks, but can be accomplished by reflex action, as happens after the excitation of the superior laryngeal nerve, which leads to the inhibition of respiration and even to sudden death.

Brouardel, of Paris, was the first to use the term "death due to inhibition." His conception of death due to circulatory or respiratory inhibition was accepted for a long period without contradiction, and indeed it became somewhat abused. Thus we find that till the beginning of this century a large proportion of cases of sudden death were attributed to inhibition in medico-legal records. This proportion, however, diminishes more and more with the progress of pathology, which throws light on the real causes of certain doubtful cases of sudden death for which the term "death due to inhibition" was advanced only to cover ignorance of the real causes of death.

In the early days it was common to speak of two kinds of death from inhibition, primary and secondary, the latter term being used to cover asphyxia and cardiac or respiratory syncope, which were due to definite diseases to which the inhibition was regarded as being secondary. The same descriptive terms were later applied to shock.

What is Meant by "Death from Inhibition"?

Among the cases reported by medico-legal experts are the following.

Two boys, aged 12 and 14, were playing together when one kicked the other in the abdomen. The victim dropped dead instantaneously. The necropsy did not reveal any lesion which would explain the cause of death, nor was there a trace of ecchymosis on the abdominal wall.

A midwife was practising abortion on a young woman in the early months of pregnancy. While endeavouring to introduce a type of cannula into the cervix the patient suddenly complained of difficulty of respiration, relaxed, and died. Nothing was found at the necropsy to explain the cause of death, not even traces of ecchymosis on the cervix.

Other reported cases occurred after the introduction by a surgeon of a catheter into the bladder, and after a slight blow on the testicles. In such cases may be found only superficial abrasions or a little discoloration of the skin on the site of the blow, or even no signs at all.

In my fifteen years' experience of medico-legal cases I have encountered, out of more than 2,000 sudden deaths, two cases which I could not explain except by the mechanism of inhibition.

The first was that of a boy aged 16 leaving his house on the river-bank just after lunch, and wearing his swimming-suit. He joined a number of companions, jested with them, and then rushed into the river for a swim. After a few minutes he disappeared from their view and could not be found. His parents were informed, search was made, and the body was recovered a few hours later. A necropsy was performed the same day, before putrefaction had taken place. We found him to be healthy, without any sign of injury, either superficial or deep, on the body. His stomach was full of undigested food, and there was a small amount of unclotted blood in the heart cavities. No pathological signs were detected in his organs macroscopically, and especially no sign of drowning. For the purpose of accuracy we sent specimens of his viscera—heart, kidneys, suprarenals, spleen, pancreas, liver—for microscopical examination. The report stated that nothing was detected except congestive reaction in the above-mentioned viscera, and I personally contacted the family to inquire about his previous state of health. They assured me that he did not complain of any weakness or disease, and that he was a good swimmer. The entire circumstances of the accident were substantiated by his friends.

The second case was that of a police student aged 23. While engaged in a game of football he was struck on the abdomen by the ball and dropped dead while uttering the word "Ah!" The accident was witnessed by the other players, especially by two of his own team very near to him at the time. A necropsy was performed speedily, and before putrefaction took place. No sign of violence was observed either superficially or deep in the muscular layers. A small quantity of unclotted blood was found in the heart cavities and a little food of a pasty consistency in his stomach; there was a general congestion of his viscera, but no pathological signs were detectable either macroscopically or microscopically.

Faced with these two cases, my conclusion was definite that death was due to inhibition; this was supported by (1) the absence of any pathological, traumatic, or toxic signs, and (2) the circumstances which surrounded the fatalities. It was a conclusion reached by exclusion of other possible causes.

Mechanism of "Death from Inhibition"

It is not necessary to enter into details and relate all the theories and hypotheses of the mechanism. A summary will suffice. The principle discovered by the Weber brothers still obtains and is the basis for the explanation of the occurrence of such cases. With regard to the inhibition reflex physiologists are in accord; their view is that it is accomplished through the centres existing in the central nervous system. According to the latest conception the transmission is performed by the liberation at the nerve-ending of small amounts of highly active substances which exert their effects on, and are quickly destroyed in, the tissues. The degree of trauma and the type of irritation which can lead to such changes and to the liberation of the substances which act as the medium for the transmission of the inhibitory reflex have not yet been determined.

The Domain of "Death from Inhibition"

Death from inhibition, as it is generally accepted, covers all sorts of sudden death occurring within a few seconds, or not longer than two minutes, after trauma or peripheral excitation relatively simple and not in itself sufficient to cause death. No pathological changes which would be liable to account for death must be present at the subsequent necropsy.

All medico-legal authorities are satisfied that this kind of death is explicable only on a basis of the "arrest" or "inhibition" theory by excitation of some part of the vagus. Some authors attach special importance to certain parts of the body, such as the laryngeal, epigastric, testicular, cervical, and cardiac regions, when these are subjected to trauma or irritation; others endeavour to classify the deaths according to whether they are frequent, rare, or exceptional in the regions involved; while some suggest that death may take place irrespective of the area concerned.

I am of the opinion that certain regions, as mentioned above, are of particular importance in this matter, and also that there must be a special personal sort of constitutional susceptibility which varies from individual to individual. Highly emotional beings, for example, are

considered to be more liable to such accidents. Such would be the case with persons in full digestive activity, and during pregnancy too—conditions which are accompanied by definite humoral changes.

Excessive emotion—termed by some authors psychical trauma—following disturbing news or incidents has been advanced as a cause of death from inhibition. Actually I did not find in the literature any such cases worth serious consideration, and if they have occurred it appears probable that they are due rather to pre-existing heart disease, with emotion provoking a sudden hypertension. A fatal result in such circumstances can be explained easily: death occurs as a result of functional failure. So we agree with those who justifiably doubt the possibility of death due to inhibition by pure emotion in a healthy person.

Some writers use the expression "syncope" for death due to inhibition occurring under the conditions previously mentioned, and, as it is known that syncope is a temporary or definite result of many different causes, whether pathological or non-pathological (syncope=fainting), this term cannot by itself be considered as equivalent to death from inhibition, in which, although it ends by fatal syncope, the mechanism is an inhibitory reflex, which makes syncope a secondary phenomenon.

Shock

Cases of anaphylactic shock, of course, have different symptoms and causes, and the mechanism is due to the disturbances within the tissue cells arising from the combination of antigen and antibody within them. In cases of air embolism the mechanism of death is either asphyxia or cardiac paralysis due to fatigue, or a combination of both. The most important element of confusion is that which happens with shock, and that I shall now proceed to emphasize in detail. It is not my intention to deal with the various controversial theories of shock. I shall be satisfied with describing its symptoms and the explanation of its mechanism according to the best modern authorities.

"Shock is a circulatory deficiency, not cardiac or vasomotor in origin, characterized by a decreased volume of blood, reduced cardiac output (volume flow of blood), and by haemoconcentration." The activity of the vasomotor system is not impaired. Shock can be produced when all nerve paths between the brain and the body have been severed (Moon).

Factors in Development

Two major factors operate in the development of shock.

1. Atony and dilatation of capillaries and venules in extensive visceral areas.—These are brought about by factors which reduce the volume of blood: loss of blood by haemorrhage decreases the volume of blood directly. This leads to anoxia and thereby causes atony of minute vessels leading to shock. A decreased volume of blood may develop indirectly by the transudation of plasma through endothelial walls whose permeability has been increased by any of the agencies (mechanical, physical, or chemical) which affect capillaries injuriously. Under the influence of any of these agencies the closed capillaries in an area quickly open to normal or supernormal diameters.

2. Anoxia.—The accumulation of waste products due to deficient oxygenation will of itself result in atony and dilatation of the minute vessels. (Either of these factors operating alone brings the other into action, constituting a vicious circle.) None of these factors depends upon failure of the heart or of the vasomotor mechanism, but directly upon chemical influences acting on the contractile walls of capillaries.

A disparity between the volume of blood and the volume-capacity of the circulatory system may result from the factors under group 1 or group 2. Usually factors of the two groups are acting simultaneously. The delivery of oxygen to the tissues is reduced in proportion to the decreased volume-flow of blood. This factor of itself produces anoxia of the tissues and reduces all metabolic process.

Illustrative Case.—An officer, whose left thigh had been caught between two logs in the wreckage of a dug-out from the explosion of a shell, remained thus for 24 hours, alert and guiding the efforts of his rescuers. There were no wounds, no loss of blood, and no indication of nervous depression. Above the knee were two deep hollows produced by the pressure of the logs, and the limb below that point was purple from lack of circulation. Evidence of shock developed some hours after his rescue, and in spite of treatment for this he died 32 hours after the release of his leg from the pressure (Cannon).

Causal Factors.—These consist of extremely painful injuries, such as extensive burns, and mangling or laceration of the body in machinery. Shock is especially common in injuries which involve the exposure and mishandling of the abdominal organs and intense peritoneal and other infections, and in severe intoxications and acute poisoning of diverse kinds.

Conditions Favouring Onset of Shock.—It was noted that hunger, fatigue, exposure to cold, rough journeys in ambulances or on stretchers, poor splinting or faulty immobilization of injured parts, and especially delays of several hours entailing a combination of these factors, greatly enhanced the danger of death by progressive circulatory failure.

Signs and Symptoms.—Prostration, restlessness, depression, and rapid pulse, which is feeble and of small volume, are present. Extremities are cold and the body temperature is low. The face is drawn, ashen or livid in colour, anxious in expression (and moist with cold sweat). The eyes are sunken and surrounded by bluish rings. Thirst is incessant, vomiting and perspiration are profuse, and there may be diarrhoea. Respirations are shallow and interspersed with deep sighs. The blood pressure declines progressively. Urination is scanty or suppressed. Consciousness is retained until finally there is loss of sensitivity, of responsiveness to stimuli, and of the reflexes. Unconsciousness or coma precedes death. Sometimes a marked and rapid increase in temperature (agonal fever) precedes death. Haemoconcentration is detectable early, and provides an accurate index of the severity of the shock (Moon).

Post-mortem Findings.—Congestion and oedema of the lungs, congestion of the gastro-intestinal mucosa and other viscera, and occasional petechial haemorrhages in mucous and serous surfaces are found. Superficial veins are collapsed and bloodless. The blood in the heart, the great vessels, and the parenchyma of organs is dark and thick, and has failed to clot. The serous surfaces are diffusely congested and appear cyanotic. The bowels are atonic, relaxed, and distended. The minute vessels along the mesenteric attachment are engorged and prominent. The lungs are intensely congested, either diffusely or in areas, producing a mottled appearance. Marked oedema is present. Liver and kidneys are deeply congested; blood oozes and drips from the parenchyma when sectioned. The spleen usually contains less blood than normal. Effusions into serous cavities and capillary haemorrhage occur. Anoxaemia is a regular feature in the late stages of shock. The parenchymatous degeneration seen in the myocardium, liver, and kidneys may be due to anoxaemia.

Primary Shock

Most of the recent writers on shock incline not to divide the subject into primary and secondary, as the early writers did, thus causing a serious confusion among medico-legal writers by inducing them to regard primary shock as the cause of death from inhibition. A thorough search for an example of a case of primary shock produced one which may be said to represent what is really meant by primary shock.

A youth of 19, while lying in a shallow trench, was hit by a shell fragment and suffered a compound fracture of the tibia. He did not lose consciousness. There was no appreciable haemorrhage. Two minutes later his chief complaint was thirst. He had no pain. He was extremely restless, throwing the injured leg about with flail-like motions at the fracture. Although sweating profusely, he complained of feeling cold. Respiration was apparently normal. The pulse, at first slow, later became rapid, and remained small and barely palpable. On the basis of findings in similar cases, his systolic pressure was probably below 70 mm. Mentally he was quite alert and talked about his experiences while the limb was splinted without anaesthesia. Apparently this procedure gave him no pain. Later his condition improved and he was able to be moved to a dressing station.

Shock may develop almost instantly at the time of injury, and it is then known as "primary." It may develop slowly after some hours, and it is then known as "secondary" (Macleod). When primary shock occurs incident to severe injuries it may merge imperceptibly into the grave condition of secondary shock (Moon).

From what has been advanced with regard to primary shock it has become obvious that it is related to one of two things: either it is concerned with a rapid onset of a state of shock or it may be a form of abortive shock; its gravity lies in its possible development into the classical form of shock.

Distinctive Characteristics

Having reviewed the facts relating to death by inhibition and shock it seems opportune to compare the main elements distinguishing the two syndromes. It should be pointed out that, despite the infrequent occurrence of pure fatal inhibition, which is usually met with only by medico-legal experts of long experience, it constitutes a special entity all its own, differing completely from shock in its circumstances, its causes, its mechanisms, its symptoms, its pathological results, and—what is of great interest to the medico-legal expert—its legal implications.

This entity covers cases in which relatively simple trauma or peripheral irritation results in death, with a lapse of time not exceeding two minutes, by a special mechanism—namely, an inhibition reflex. Experiments have not yet determined all its elements. Its diagnosis is arrived at by the absolute exclusion of any traumatic, pathological, or toxic cause, acute or chronic, which may be found during the necropsy, and by the circumstances surrounding death. This entity must not be confused with syncope, which is inadequate to express its individuality.

Embolism and prophylactic shock have also different mechanisms; and finally "shock" (traumatic shock), as we have seen, whether primary or secondary, is definitely a different syndrome, being essentially a circulatory deficiency which can be obviated in certain cases, as it can be diagnosed easily in time and can be treated, and does not necessarily end in death. It has an obvious pathological criterion.

Main Distinctive Characteristics Differentiating Shock and Death by Inhibition

	Shock	Death by Inhibition
Nature	Its major factors; anoxia, atony, and vascular dilatation	Its essential factor: arrest of the vital organ
Cause	Macrotrauma, producing extensive destruction or haemorrhage	Microtrauma producing very slight injury or none
Mechanism	Circulatory deficiency due to chemical influence	Inhibitory reflex
Development ..	Progressive	Instantaneous
Appearance	Characteristic	Nothing characteristic
Post-mortem findings	Pathological criterion	No pathological criterion
Elements of diagnosis	Clinical and pathological	By exclusion of any pathological causes, backed by circumstances preceding death

Conclusion

My final aim is to emphasize that death by inhibition is an entity. Facts may receive varying explanations but remain essentially unchanged. The medico-legal expert will be confronted with such facts and will be dealing with a special kind of sudden death to which the term "death by inhibition" is rightly given, and which is not readily susceptible to controlled study. Its lack of pathological criteria will never disturb the established reality: it may, however, be anticipated that sooner or later advances in pathology may lead to the establishment of final proof. At present it is the duty of the medico-legal experts to keep in mind these facts and give them the weighty consideration to which they are entitled.

I wish to thank Prof. Sydney Smith and Prof. A. Murray Drennan for their keen interest and for placing the facilities of their departments at my disposal.

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The Ministry of Health has issued three explanatory leaflets (S.D.A., S.D.B., and S.D.C.) on superannuation in the National Health Service. They supplement the Ministry's booklet on the superannuation scheme which has already been issued. Leaflet S.D.A. is being sent to local authorities owning hospitals to be transferred under the Act, and it explains the option open to employees transferred under the Act to retain rights corresponding with those enjoyed before transfer. Leaflets S.D.B. and S.D.C. are being sent to voluntary hospitals. The former explains the option open to employees to remain on their present superannuation scheme; and S.D.C.—for employees with not less than 10 years' hospital service before July 5—explains the broad principles which the Ministry of Health will apply when dealing with applications for payments on retirement or death equivalent to those that might have been expected under the voluntary hospital service.

THE CREMASTERIC VESSELS AND THE REPAIR OF INDIRECT INGUINAL HERNIA

BY

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AND

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It has been generally accepted by most surgeons that a repair is a necessary step in the operative treatment of inguinal hernia in the adult. High ligation of the peritoneal sac alone will not infrequently produce a cure; but the internal ring is dilated by the hernial sac and its contents, and after simple herniotomy it remains as a vulnerable area in the abdominal wall. It is this weakness that may account for the high percentage of indirect herniae as well as their early reappearance after operation.

All rational repairs, therefore, are particularly directed towards reinforcing this deficiency, which reveals itself at operation as a hole in the fascia transversalis. It is proposed here to draw attention to a manœuvre which is designed to display this deficiency in its entirety.

The Cremasteric Vessels

The inferior epigastric artery is a branch of the external iliac artery arising immediately proximal to the inguinal ligament; it passes upwards behind the fascia transversalis. About 1 cm. from its origin, and as it lies behind the inguinal canal, the inferior epigastric artery gives off the cremasteric artery. This small but constant vessel courses laterally deep to the fascia transversalis and then curves sharply forwards to enter the cord deep to the internal spermatic fascia, whence it divides into branches to supply the coverings of the cord (Fig. 1). The artery is accompanied by a single vein which drains into the inferior epigastric venae comitantes.

Indirect Inguinal Hernia and Cremasteric Vessels.—The hernial sac enters the cord as a diverticulm and lies anterolateral to the structures of the cord. The internal ring is dilated by the viscera entering the peritoneal sac and the cord increases in volume. As a result of these changes the

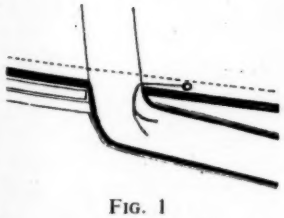

FIG. 1

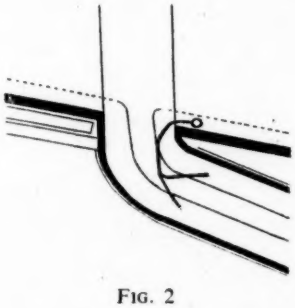

FIG. 2

cremasteric artery runs a relatively shorter course before curving into the cord (Fig. 2). In long-standing herniae the artery is slightly enlarged.

Repair of Indirect Inguinal Hernia.—After the cord has been exposed and its coats incised the hernial sac is separated and is ligated at the point where it arises from the peritoneum (Fig. 3). With the removal of the peritoneal sac the volume of the cord is correspondingly decreased. The cord is retracted laterally and the posterior wall of the inguinal canal is exposed. Lateral to the inferior epigastric vessels lies the defect, and to perform an effective repair this must be clearly displayed. This can be done only by displacing the cord to the lateral boundary of the internal ring. The cremasteric vessels, as has been shown, ramify over the cord, and their lateral course has been shortened

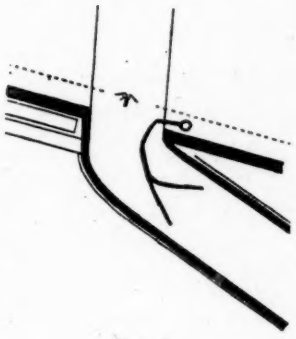

FIG. 3

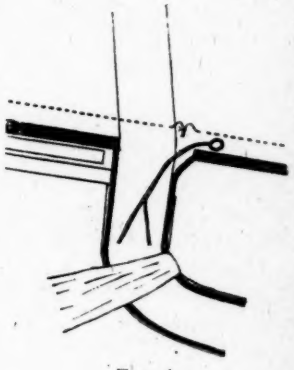

FIG. 4

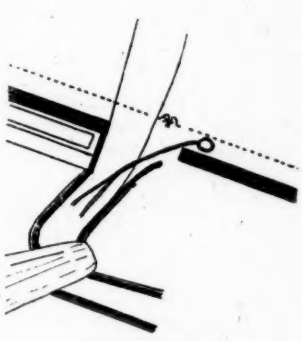

FIG. 5

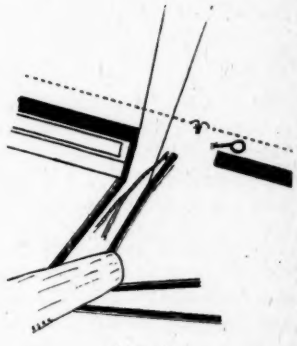

FIG. 6

by the presence of the hernia. These vessels and their covering of fascia virtually constitute a ligament (a structure which might be termed the cremasteric ligament) which prevents the full lateral displacement of the cord and obscures the actual size of the deficiency at the internal ring (Figs. 4 and 5).

Ligation of the Cremasteric Vessels in Repair of the Hernia.—After the cremasteric vessels covered by their fascia have been exposed they are divided between silk ligatures. With the division of this "ligament" the cord can be displaced laterally, sometimes as much as 2 cm. Moreover, the whole of the weakened area in the fascia transversalis is exposed and is readily repaired (Fig. 6).

Summary

It is submitted that ligation and division of the cremasteric vessels is a necessary step in the repair of the indirect inguinal hernia. These vessels and their surrounding fascia constitute a ligament which tethers the cord to the medial boundary of the internal ring and prevents its full and essential displacement to the lateral boundary. The deficiency at the internal ring is neither satisfactorily visualized nor repaired until it has been fully exposed by this procedure.

"When trying to find out whether animals are conscious of pain, one may easily be misled by their reaction or lack of reaction to injury. The best evidence is derived from the resemblance between the sensory and nervous systems of some animals and the corresponding systems in ourselves. Evidence of this kind suggests very strongly that at least the higher vertebrates are capable of suffering. It is much harder to obtain evidence as to whether invertebrates are conscious, but it is reasonable to suppose that this is so in those forms in which the nervous system is complex and highly integrated (for instance, the crab and octopus). It is very unlikely that such a creature as a sea-anemone is conscious."—*The Scientific Basis of Kindness to Animals*, by J. R. Baker (U.F.A.W.).

HODGKIN'S DISEASE: AN UNUSUAL CASE WITH SPINAL SYMPTOMS

BY

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We record this case because it displays certain less-known features of lymphadenoma which are of greater moment than a mere record of unusual manifestations of a protean disease.

Case History

The patient, a house-decorator aged 49, was in good health until October, 1942, when he noticed a swelling of the neck. Clinical examination in December revealed a mass of firm discrete glands in the left side of the neck and supraclavicular region and some smaller glands in the right axilla. No other abnormality was found clinically and the patient felt well. The red cell count, haemoglobin estimation, and total and differential white cell counts were normal. A large cervical gland was removed, and was reported on as a lymphadenoma by Dr. Fraser, pathologist to the Bristol Royal Infirmary. Radiotherapy was started in January, 1943, under the late Dr. Bryan Adams. (Details of radiotherapy are given in an Appendix.)

In March, 1943, a nodule the size of a walnut still remained in the left side of the neck, but this had disappeared by May, 1943, when no other abnormality could be detected. The patient was examined at three-monthly intervals and was well until August, 1946, when he complained of pains in the back and down the right leg. Clinical examination did not reveal any abnormality. Radiological examination did not show tumour involvement of the vertebrae, but osteoarthritic changes were noticed. No treatment was given. One month later the patient was seen again; he complained of having had lower abdominal pains, the character of which suggested girdle pains, and now had loss of power of the right leg and weakness of the left leg. On examination a mass in the right iliac fossa was found, with wasting of the right gluteus maximus and of the right hamstrings, weakness of both lower limbs, especially the right, spasticity, exaggerated tendon reflexes, and analgesia corresponding to a cord lesion at the level of the tenth dorsal segment. Sphincter control was normal. No further details are available.

Radiotherapy was then directed against the iliac mass and the spinal column between the eighth dorsal and the second lumbar vertebrae. On completion of the course the mass in the right iliac fossa had disappeared; the patient was free from pain, but loss of power in both legs was almost complete and he was now incontinent of urine and faeces. He was considered unfit for further radiotherapy and was removed to another hospital, where he was found by one of us to have the clinical picture of a complete transverse lesion of the spinal cord in the lower dorsal region. The cerebrospinal fluid was under normal pressure and showed a normal response to jugular compression. The protein, chloride, and cellular contents were normal, and the globulin and Lange tests were negative. Introduction of 2 ml. of lipiodol into the cisterna magna did not demonstrate spinal block.

In January, 1947, a suprapubic cystotomy was carried out and treatment was directed to keeping the patient comfortable. Large bed-sores and urinary infection developed and he died three months later—i.e., four and a half years after the onset of symptoms.

Post-mortem Examination

The body was extremely emaciated and dehydrated. There were large scars in the region of both knee-joints and marked talipes equinus. A large bed-sore took up the sacral area, buttocks, and lower half of the back; surrounding tissues were thickened and oedematous. No enlarged glands could be palpated and no glands could be found in the cervical, supraclavicular, axillary, or mediastinal regions, or in the abdomen. A few small soft glands were present at the hila of the lungs and in the inguinal region; these were taken for examination. The structures of the mouth, neck, thorax, and abdomen showed no evidence of lymphadenoma: in particular the liver (2,035 g.) showed only a uniform nutmeg pattern, the spleen (130 g.) was small and presented a uniform pale-red pulp, and section of the ribs revealed a red marrow. Apart from the vertebral column the following were the only abnormalities found.

The lungs showed oedema and hypostatic bronchopneumonia; the heart was flabby and the left ventricle was dilated. There was marked pyelonephritis and cystitis, with slight dilatation of the renal pelves and ureters; the prostate contained abscesses. No mass was found in the right iliac fossa, but there were slight diffuse adhesions tacking down the caecum. The vertebral column and its integument showed no external abnormality or deformity. Section revealed a uniform sclerosis of the bodies of the seventh and eighth dorsal vertebrae, so that they were harder and paler than those of the other vertebrae, but none of the bodies showed any disorganization of architecture.

Removal of the spinal cord revealed no abnormality of the bony canal. The dura appeared normal and not even roughened on inspection with a hand-lens. The pia-arachnoid and nerve roots also appeared normal. The spinal cord showed slight evidence of flattening and softening in the upper lumbar and lower dorsal region. The cranium and the brain and its membranes showed no abnormality.

Histological Examination

Apart from moderate periportal fatty change the liver was normal, as was the spleen. The hilar and inguinal lymph glands showed a subacute inflammatory sinus catarrh. The sclerosis of the dorsal vertebrae was accounted for by a generalized increase of fibrillar connective tissue throughout the marrow, diminished vascularity, and hypoplasia of the cellular elements of the marrow so that they were represented by scanty small round cells. Other vertebrae examined revealed no abnormality. The spinal cord showed a transverse myelitis in the upper lumbar region, a segment of it having large patchy areas of demyelinization irregularly scattered in all zones. Sections just above this level showed complete degeneration of the posterior ascending (sensory) columns, and sections below showed complete degeneration of the crossed and direct pyramidal tracts. No cellular lesion was found in the cord. These appearances are consistent with a transverse lesion produced by local external pressure.

The Original Biopsy

Dr. Fraser kindly gave us the original slide. The section was from a gland 1.2 cm. in diameter, and showed the classical features of Hodgkin's disease: there was complete replacement of the normal architecture by a pleomorphic cellular tissue containing the characteristic reticulum cells, some in giant form with or without double nuclei in mirror-image form, eosinophil leucocytes, lymphocytes, and plasma cells. The cellular tissue was broken up by a fibrillar stroma condensed into thicker bands in a few places.

Discussion

While the sceptic might be inclined to consider that the train of events originated with a mix-up in biopsy specimens and ended with a nervous disease complicated by deep *x*-ray therapy, the findings are not unknown. There are a number of accounts of cases of lymphadenoma with clinical remission from 10 to 36 years (Holmes and Schulz, 1946; Jackson and Parker, 1946). One must therefore conclude that, exceptionally with deep *x*-ray therapy, the disease may remain latent for long periods or completely disappear. Our case is remarkable in that we did not find evidence of the disease even in the form of a sclerotic process. It is considered that the sclerosed vertebrae are accounted for by the effects of radiotherapy, and if there was previous marrow involvement by lymphadenoma it was not sufficient to disturb the bony architecture. Robinson (1928) reports a similar finding in a case with spinal

symptoms treated with radiotherapy. The slight adhesions of the caecum are not uncommonly found at necropsy, and were not of a nature to indicate a healed lymphadenomatous lesion.

Spinal symptoms, though rare in lymphadenoma, are not unknown. The extensive literature has been reviewed by Allen and Mercer (1936). The clinical histories are similar to ours and are of paraplegia consistent with a transverse myelitis. Destruction of vertebrae by lymphadenoma tissue sufficient to cause collapse and compression fracture is rare, as also is pressure on the cord from lymphadenoma tissue extending direct from involved vertebrae. The commonest finding is a growth of lymphadenoma tissue in the epidural space adherent to the dura. Rarely this tissue has been found continuous through the intervertebral foramina with growth outside. The usual finding is an isolated epidural mass with no direct connexion with lymphadenoma tissue elsewhere, no bony lesion, and marked involvement of contiguous para-aortic lymph glands. A few cases with similar histories of paraplegia are, however, not immediately explicable on this basis. These cases have had either an epidural mass too small to cause the cord symptoms or no epidural mass at all. In all types gross demyelinization is present at the appropriate cord level. Weil (1931) recorded epidural masses in 37 of 46 cases analysed, but in three there was only dural scarring. He interpreted this latter finding as indicating that lymphadenoma tissue capable of producing symptoms had previously existed. Those patients had received radiotherapy. Since in our case there was a transverse myelitis no different from what one finds in cases of compression fracture of a vertebra we consider that a similar explanation holds. This explanation is reinforced by the fact that in our case manifestations of lymphadenoma elsewhere had also completely disappeared.

In the type of case such as we have described Allen and Mercer dispute the belief that a dural lesion need necessarily have been present. They describe two cases with paraplegia, untreated by deep *x*-ray therapy, in which, though extensive lymphadenoma was present elsewhere, there was no lesion of the dura or of the spinal column. The spinal-cord lesion was an extensive oedema of the cord with slight congestion and round-cell infiltration. Recalling Gordon's results with intracerebral injection of lymphadenoma extracts in rabbits, they argue that the cord lesion is a similar type of viral or toxic reaction localized by the presence of extensive gland involvement with lymphadenoma in contiguous para-aortic glands; but their arguments could be equally well used to ascribe the cord lesion to lymphatic oedema secondary to the blockage of the paravertebral lymph circulation. Allen and Mercer's findings, however, indicate that a dural lesion need not always be the mechanism of cord lesions in lymphadenoma. Pathologists would be advised to bear this dispute in mind in future cases and to plan their investigations to allow of an examination of the paravertebral lymphatic plexus.

Robb-Smith (1947) has reported briefly some interesting results since he instigated an attempt to produce a rational classification of the progressive lymphadenopathies. From classical lymphadenoma (verum) he differentiates, among others, lympho-reticular medullary reticulosis—a progressive lymphadenopathy in which the morbid lymphoid tissue consists of a proliferation of lymphocytes and abnormal reticulum cells as in lymphadenoma but lacking the essential fibro-myeloid element (fibrillar tissue, leucocytes) of the latter. Previously lympho-reticular reticulosis would have been included as a disease in the "Hodgkin group," which indeed Pullinger (1932) describes and illustrates. According to Robb-Smith (1947) the disease has a better prognosis than lymphadenoma verum, and he states that it is "a slowly progressing disorder commonly presenting with lymph-node enlargement at a single site, most commonly cervical, and after this has been treated by surgery or radiotherapy there will be a symptom-free interval of several years and then a recurrence at a different site. There is a liability for paraplegia to develop in the later stage due to dural involvement, and sarcomatous transformation may take place after a course of ten to fifteen years." Our case, with primary involvement of cervical and axillary glands, their disappearance, and a symptom-free interval of three and a half years, followed by recurrence in the right iliac fossa and development of spinal symptoms, is similar to his account. Whilst this behaviour may be truer for lympho-reticular reticulosis it can be said that occasionally lymphadenoma verum may behave similarly, as our case showed the classical histology of lymphadenoma. Robb-Smith's account reinforces our argument that, despite the negative findings at the necropsy, our case is encompassed by the protean natural history of Hodgkin's disease, and we hope that this account will encourage the clinician to search for the earliest signs of cord involvement so that treatment may be directed at an amenable stage.

Summary

A case is described of lymphadenoma verum involving cervical and axillary glands which resolved after radiotherapy. Three and a half years later glands in the right iliac fossa became involved and symptoms of paraplegia developed consistent with a transverse myelitis. Radiotherapy was directed to the spine and the iliac region. Post-mortem examination six months later revealed no trace of lymphadenoma anywhere and nothing to account for a transverse myelitis of the upper lumbar zone.

Attention is drawn to the literature of lymphadenoma with spinal involvement, in which symptoms of transverse myelitis are commonly accounted for by dural masses of lymphadenoma tissue. More rarely, no dural or bony lesion may be found to account for the cord involvement, though there is marked involvement of contiguous para-aortic lymph glands. In this circumstance the theories of possible pathogenesis of the spinal lesion are briefly referred to. The unique train of events in our case is shown to be consistent with the known vagaries of lymphadenoma.

We wish to thank Dr. P. Phillips, medical superintendent, Southmead Hospital, Bristol, for permission to publish this case.

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APPENDIX

Details of X-ray Therapy

Factors.—200 kV.; 15 mA.; 50 cm. focal skin distance; 1 mm. Al + 1 mm. Cu filtration; 30 r/minute intensity. (All incident doses are without back scatter.)

Jan. 14 to Feb. 19, 1943.—(1) Left supraclavicular area: Field (15×15 sq. cm.); 9 applications, each 150 r incident. (2) Right axilla: Field (15×15 sq. cm.); 7 applications, each 150 r incident.

Sept. 18, 1946.—Pelvis (4 fields) (anterior 20×15 sq. cm., posterior 20×15 sq. cm., right lateral 20×10 sq. cm., left lateral 20×10 sq. cm.); 19 applications to each field, each 100 r incident, giving total dose in pelvis 3,325 r.

Oct. 15 to 23, and Oct. 31 to Nov. 6, 1946.—Spine, L.5–D.8; 2 fields, left and right posterior oblique, each 18×7 sq. cm.; 13 applications to each field, each 200 r incident, giving total dose of 4,375 r on area of spine treated.

Medical Memoranda

A Case of Intramedullary Abscess: Recovery after Operation

The following case is recorded because of its rarity and because of the successful result achieved by operation and chemotherapy.

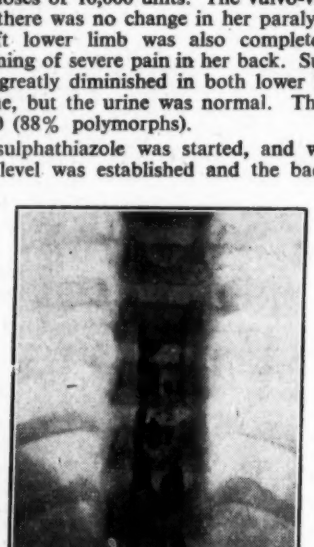
CASE REPORT

A girl aged 6 was admitted to the Children's Hospital, Tehran, in April, 1945. For a month she had complained of backache and had been suffering from diarrhoea and vulvo-vaginitis. On examination it was found that she had an exaggerated lumbar lordosis and some scoliosis in the dorso-lumbar region. Movements of vertebrae in this area were somewhat limited. This stiffness of the back made walking difficult. No abnormal neurological sign could be found. Radiological examination failed to reveal any bony lesion. She was having an evening temperature of 37.5–38° C. The report on the vaginal discharge, which was repeatedly examined, was: "Diverse micro-organisms. Gram-positive cocci and Gram-negative bacilli. No gonococci seen." Diarrhoea and vulvo-vaginitis soon cleared up; but a month after admission, when she was discharged at her mother's request, she still complained of pain in her back.

Seven months later (Dec. 22, 1945) the girl was readmitted. According to her mother the backache had gradually become worse and vulvo-vaginitis had recurred. On examination it was seen that the general condition was poor and walking very difficult. The vertebral column was kept absolutely rigid, with severe lumbar lordosis. There was left foot-drop. The left knee-jerk and both ankle-jerks were absent. No sensory impairment was found. Her evening temperature was 37.5–38° C. Radiographs of dorso-lumbar vertebrae were again normal.

"Oestroform" and vitamin B injections were given without benefit. On Jan. 25, 1946, she was dragging both her feet, and on Feb. 4 there was complete flaccid paralysis of the right lower limb. On Feb. 7 she was put on systemic penicillin therapy—100,000 units were given in three-hourly doses of 10,000 units. The vulvo-vaginitis completely cleared up, but there was no change in her paralytic condition. On Feb. 17 the left lower limb was also completely paralysed and she was complaining of severe pain in her back. Superficial and deep sensations were greatly diminished in both lower limbs. There was retention of urine, but the urine was normal. The white cell count numbered 13,400 (88% polymorphs).

A course of sulphathiazole was started, and within two days a definite sensory level was established and the backache completely



disappeared. Below the level of the first lumbar segment sensation to touch was lost. Pin-prick sensation was also absent except for a small area in the anterior aspect of both thighs. There was faecal incontinence as well as urinary retention with overflow. A radiograph of the spine again showed no abnormality.

In view of the possibility of some infection in the lumbar region, lumbar puncture had not been performed until this date. Puncture was done on Feb. 23. A few millilitres of golden-yellow fluid under low pressure was obtained: albumin, 0.85 mg. per 100 ml.; 20 mononuclear cells per c.mm.; no micro-organisms. Two days later a descending myelography was performed. "Iodatol," 2 ml., was injected through a cisterna magna puncture. As is shown in the accompanying radiograph the opaque substance did not pass below the level of the upper border of the eleventh dorsal vertebra.

The parents were reluctant to consent to an operation, but on March 10 permission was obtained. By this time the patient's general condition was very poor and paralysis of the lower limbs complete.

Operation.—Open-ether anaesthesia was administered. The eleventh and twelfth dorsal laminae were removed. The dura mater was tense; it was carefully incised in the middle line. The cord presented all the appearances of an intramedullary tumour, and had completely filled the canal. In the lower reaches of the opening there were some fibrinous deposits on the nerve roots. On palpation of the cord with two fingers distinct fluctuation could be obtained. The swelling was aspirated exactly in the middle line and 3.5 ml. of frank pus withdrawn. Penicillin, 20,000 units, was introduced into the cavity, but most of it escaped from the puncture spot into the theca. The cord did not completely collapse, and it was thought that this was probably due to oedema. As the patient's condition was unsatisfactory the wound was hurriedly closed. The opening in the dura mater was not sutured. The pus contained a large number of leucocytes, but no micro-organisms could be found. Culture and guinea-pig inoculation were also negative.

On the third day after operation the patient felt the needle-prick in the left buttock when receiving penicillin—10,000 units three-hourly were continued until the seventh day. On the fifth day she could just move her left thigh. On the ninth day stitches were removed, but from one of the stitch holes a few drops of cerebrospinal fluid escaped. The amount gradually increased and the wound had to be reopened on March 21.

The spinal cord was again examined, and fluctuation could still be obtained. This time a larger-bore needle was used for aspiration, and 4 ml. of pus identical with the first specimen was withdrawn. On this occasion the cord collapsed completely, but there was a hard nodule, the size of a split-pea, situated near the end of the exposed cord. Penicillin was again injected into the cavity of the abscess. The muscular layers were sutured with care. The wound healed without any further difficulty.

Sensation and movements slowly returned to the paralysed limbs. On the anterior aspect of the left thigh there was severe hyperaesthesia for some days. Sphincter disturbances also gradually cleared up. A month after the first operation her micturition, and ten days later the defaecation, were under control.

Two months after the first operation she could walk if someone would hold her hand. On Aug. 28, 1946, five months from her last operation, she walked without any difficulty, but her gait was somewhat waddling. In walking, both feet were held in the valgus position. She had no backache and had gained 3 kg. in weight. Her general condition was excellent.

Muscular power of the limbs was good except for some weakness of the anterior tibiales. The left knee-jerk was weak. Both ankle-jerks were still absent. The left plantar reflex was flexor but the right was doubtful. Sensation to touch, pin-prick, and position was normal.

DISCUSSION

An abscess within the spinal cord is a rare condition. Woltman and Adson (1926) published a case of their own, and gave a summary of 29 other cases reported in the literature up to that date. P. K. Arzt (1944) in a review of the literature was able to find 39 cases, including the 29 already referred to. He discussed all aspects of this disease at length and added three cases of his own.

Prognosis in this condition seems to be very poor. Only four cases have been treated successfully by operation, but in one of them paraplegia did not improve. Six other cases were also submitted to operation, but the outcome, as in all other cases, was fatal.

In the majority of cases reported a primary focus of infection had been found. In the above case it is possible that micro-organisms entered the circulation from the known focus of vulvo-vaginitis. In Uhlmann's case, in which multiple intramedullary abscesses were found, the primary focus was a gonococcal urethritis.

In none of the surgically treated cases had chemotherapy been tried, and the successful result obtained in my case is probably largely due to penicillin and sulphathiazole medication.

My thanks are due to Mr. Brodie Hughes, surgeon in charge, Neurosurgical Department, Birmingham United Hospital, for his advice and encouragement in the final preparation of this paper.

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Reviews

CLASSIC OF OPHTHALMOLOGY

Handbook and Atlas of the Slit Lamp Microscopy of the Living Eye. By Prof. Alfred Vogt. Iris, Vitreous Body, Conjunctiva. Translation of Volume III of the second, much enlarged edition of the *Atlas of Slit Lamp Microscopy*. (Pp. 344; 985 illustrations, mostly in colour. £16 10s.) Zurich: Schweizer Bruck und Verlagshaus. London: H. K. Lewis and Co. 1948.

Of all the organs of the body the eye is unique in the opportunities it provides for detailed clinical examination. Because of its ready accessibility and the transparency of its tissues the living structures can be studied in minute detail; changes which might be sacrificed in the mutilating techniques of the histologist may be rendered apparent, or minutiae which are not amenable to differential staining may be revealed by differences in optical properties. In this way the early signs of disease or the finer points of diagnostic or prognostic significance are determined in the eye with a certainty unobtainable in other organs. Not only is this of value to the ophthalmologist in determining the presence of local disease, but to the general clinician and the pathologist the opportunities thus provided by biomicroscopy are equally great. Ophthalmology as a specialty has taken full advantage of these possibilities, and in the slit-lamp—the combination of focal illumination and an erect-image microscope—it has at its disposal a very efficient technical instrument.

The late Alfred Vogt, of Zurich, who introduced the technique of obtaining brilliant and uniform optical sections of the ocular tissues with this instrument, has been the most enthusiastic exponent of the method, and by his unflagging industry and unusual clinical acumen has made immense contributions to ophthalmology in the third and fourth decades of this century. His observations were collected and systematized in his *Atlas*, the first edition of which appeared in 1921. The present volume is the third part of the greatly expanded second edition. It contains an account of the iris, ciliary body, and conjunctiva, and includes an important contribution on the lens. The author minutely describes all the classical conditions, with an abundance of case histories lavishly illustrated, and makes in addition many new observations and new associations. This volume will long remain a classic of ophthalmology and is quite indispensable to those wanting detailed and authoritative references to the subjects of which it treats.

A feature of the book is the emphasis on genetics and hereditary conditions, one of Vogt's major interests. In this respect he has made a long-term study of the eyes of twins. His conclusions are of great interest—for example, that the microscopical details of the iris and their behaviour in old age are predetermined in the germ-plasms. Moreover, in the supplement to the study of the lens, based on an imposing amount of evidence of the same nature whereby identical changes shared by monozygous twins are considered to be hereditary while variations are due to exogenous influences, he concludes that senile cataract is a phenomenon of ageing determined hereditarily on an exact parallel with greying of the hair or wrinkling of the skin. He follows out the interesting suggestion that the influence of medicaments on the formation of cataract can best be controlled by administering the medicament to one twin, the other being used as a control.

The three volumes of this *Atlas* probably constitute a reference work unique in medicine. It is a monument of accurate and detailed observation, lavishly produced, beautifully illustrated, and much of the thought is original. It is expensive to buy; but it is worth it. It is indeed a fitting memorial to one of the greatest clinical observers of our generation.

STEWART DUKE-ELDER.

BOVINE TUBERCULOSIS

Bovine Tuberculosis, including a contrast with Human Tuberculosis. By John Francis, B.Sc., M.R.C.V.S. (Pp. 220; 21 tables and 36 figures. 25s.) London: Staples Press, Ltd.

It is a pleasure to welcome a book which provides exhaustive information on an important subject for the first time. The author has done his job thoroughly, his text being fully documented and the bibliography comprising 400 references. He first discusses at length the incidence of tuberculosis in cattle. He attributes the greater incidence of the disease in dairy cows to their longer life and exposure to infection in cowsheds, and not to diminished resistance caused by lactation and calf-bearing. He then considers the morbid anatomy of the disease and its pathogenesis, concluding that 80 to 90% of animals are infected by inhalation. There is a chapter on the tuberculin test and other methods of detecting the disease. Other subjects discussed are B.C.G. vaccination and the transmission of the disease from cattle to man or vice versa. In this connexion the author might mention in a future edition the work of Sigurdsson, J. (*Acta tuberc. scand.*, 1945, Suppl. XV), who found that among Danish farming people in contact with infected cattle tuberculosis was due to infection with the bovine type of organism in no less than 40% of cases. Francis does not consider that the practical efficacy of B.C.G. has been proved in any field trial, and believes that only increasing the number of attested herds, which already include 10% of our cattle, and the more ambitious project of area eradication will make it possible to eliminate the disease, although this may take 40 years. It is a pity the book is so expensive for its size, but the coloured illustrations, including a map showing the incidence of bovine tuberculosis in different counties in Great Britain in no less than six vivid colours, are no doubt responsible for this.

L. P. GARROD.

CARDIOLOGY FOR BEGINNERS

A Primer of Cardiology. By George E. Burch, M.D., F.A.C.P., and Paul Reaser, M.D. (Pp. 272; 203 illustrations. 22s. 6d.) London: Henry Kimpton. 1947.

As the authors state in their preface, this book is a primer written to acquaint the beginner in cardiology with fundamental principles, and is particularly intended for medical students. It is meant to stimulate thought, not to be encyclopaedic. On the whole they have achieved this object, though British readers may find the text too condensed and containing too many lists; these suggest another intention—an examination primer. The book is studded with diagrams, but we doubt whether they always help to clarify the text; fuller clinical descriptions might better have replaced some of them. The authors present much fact, yet rarely draw a convincing portrait. This fault is common to most primers.

The teaching is undoubtedly good, the views orthodox and up to date. There is a refreshing absence of factual error. The style is clear and concise. Important difficulties are not evaded but squarely met. It is to be expected that with such an introduction the emphasis should be on physiology, and at least half the book is on such preliminary considerations. The authors have written up the various forms of heart disease with less enthusiasm, and have emphasized unduly toxic or infectious processes, anaemia, and malnutrition as common causes of heart disease. Curiously, they have omitted to discuss pulmonary heart disease; in fact they do not mention emphysema of the lung, though they refer to mediastinal emphysema. Pulmonary embolism is likewise not mentioned, yet paradoxical embolism is. They do not fully discuss electrocardiography, because there is a companion volume on the subject by Burch and Windsor. We can recommend this book to the British student as a reliable source of much useful information none too easy to obtain elsewhere.

PAUL WOOD.

REMEDIAL GYMNASTICS

The Rehabilitation of the Injured. By John H. C. Colson, M.C.S.P., M.A.O.T. Volume II. Remedial Gymnastics. Foreword by Sir Reginald Watson-Jones, M.Ch.Orth., F.R.C.S. (Pp. 556; 439 figures. 30s.) London: Cassell and Co. 1947.

A book of this kind has been much needed, for it correlates modern trends in the treatment of fractures with modern concepts of active methods in physiotherapy. It is perhaps a pity that Mr. Colson has intentionally not discussed the place of passive therapy, such as massage, electrotherapy, etc., for although, as he says, these are fully considered in textbooks of physical medicine as separate subjects their practical relation to active therapy in the after-treatment of fractures is but poorly sketched in most works.

He first describes the theory and rationale of specific remedial exercises. He covers the field exhaustively, but unfortunately his classification is neither clear nor simple. He would do well in future editions to prune these chapters of old-fashioned terminology that has no practical relation to the advanced theories that he teaches. In two chapters Mr. Fitton describes the relation of specific remedial exercises to the pathological changes after injury and to splints and plaster casts. The latter will be of great interest to plaster-room assistants and after-care sisters. Mr. Colson then discusses the theory behind exercises with special remedial apparatus and describes the various types with their advantages and disadvantages. He is enthusiastic about using a pulley-and-weight system for re-developing muscles. He does not like other types of weight-resistance exercise, though it is noteworthy that very dramatic results can be obtained in certain types of case by using the de Lorme system. In subsequent chapters he describes exactly the remedial exercises to be used in all the various types of bone injury, though strangely enough he does not mention torn ligaments of the knee-joint. These graduated routines are lucidly and neatly arranged in tables after an explanation of the aims of treatment at various stages. He subdivides the aims into primary and secondary—a very useful classification—reminding the physiotherapist and remedial gymnast of what is most important. Dr. Langdale Kelham then contributes a short but excellent chapter on the treatment of amputation stumps. The book concludes with a neat account of re-education in walking. The lay-out and the illustration of the book are excellent. There is no doubt that it should be studied by all who are concerned with the treatment of injuries of the spine and the extremities.

H. OSMOND-CLARKE.

INSTRUCTION IN PSYCHOLOGY

Psychological Atlas. By David Katz. (Pp. 142; 396 illustrations. $5.00.) New York: Philosophical Library, 15 East 40th Street.

Any teacher called on to provide classes of instruction in psychology and elementary psychiatry is likely to find this a useful book. It contains 395 illustrations, excellently reproduced, with verbal descriptions in the earlier part of the book. Many of these illustrations could be suitably reproduced as slides for exhibition to a class of students. The subjects covered include the anatomy and physiology of the central nervous system; optical illusions; perception and gestalt phenomena; the apparatus for and the results of experiments on memory, work, and fatigue; symbolism, with illustrations from picture writing, Chinese idiograms, and Egyptian hieroglyphs; facial expression and physiognomy; constitutional types; child psychology; psychological testing; abnormal psychology; occult phenomena; animal psychology; and conditioned reflexes. At the end are some 40 photographs of distinguished psychologists. Many of the pictures are in themselves unusual and would be difficult to come by, but are apt illustrations of particular aspects of the general theory which the teacher will be trying to expound. They are nearly all of a kind to awaken interest.

ELIOT SLATER.

The sixth edition of Prof. Cameron's remarkable little book, *Recent Advances in Endocrinology* (J. and A. Churchill; 21s.), follows only two years after the fifth. To repeat in different words the praises earned by previous editions seems unnecessary after so short an interval. If there are still any doctors who have omitted to buy the fifth edition, they should immediately retrieve their mistake by buying the sixth. Possessors of the fifth might be well advised to wait for a few months and buy the inevitable seventh, for there have been few advances in the last two years of sufficient importance to win inclusion. The new material includes an excellent short account of the uses in diagnosis and treatment of radioactive iodine and of the production of artificial iodo-proteins with a thyroid-like activity. There are a few omissions which might well be made good next year. Recent workers on exophthalmos lay more stress on the increase in retrobulbar fat than on oedema of orbital tissues. The section on prolactin does not very adequately reflect modern views on the action of the pituitary in lactation. There is a most curious omission of any mention of Verney's work on the posterior pituitary and the effects of anxiety on water metabolism. Two suggestions might be considered while the next edition is in preparation—a more detailed index and a section summarizing all new material, with references to the main body of the book.

BOOKS RECEIVED

The Clinical Picture of Thyrotoxicosis. By Peter McEwan, M.A., M.B., Ch.B., F.R.C.S.Ed. (Pp. 125. 15s.) London: Oliver and Boyd. 1948.

A general account of thyrotoxicosis, including its diagnosis and treatment.

Medical Education. By Ffrangcon Roberts, M.D. (Pp. 172. 12s. 6d.) London: Lewis. 1948.

An account of the training of students and teachers.

Diagnostic Bacteriology. By I. G. Schaub, A.B., and M. K. Foley, A.B. 3rd ed. (Pp. 532. 22s. 6d.) London: Kimpton. 1947.

A laboratory textbook on the isolation and identification of pathogenic bacteria.

Letters on Yellow Fever Addressed to Dr. William Currie. By Noah Webster. (Pp. 110. $2.00.) Baltimore: Johns Hopkins. 1947.

With an introductory historical essay.

The Worker and the State. By Sir Frank Tillyard, C.B.E., M.A., M.Com. 3rd ed. (Pp. 302. 16s.) London: Routledge. 1948.

An account of modern social legislation.

Médecine Légale Judiciare. By C. Simonin. 2nd ed. (Pp. 819. 1,100 francs.) Paris: Maloine. 1947.

A textbook of forensic medicine.

An Introduction to the Principles and Practice of Homoeopathy. By C. E. Wheeler, M.D., B.S., B.Sc. 3rd ed. (Pp. 371. 21s.) London: Heinemann. 1948.

Intended for "those who wish to form an unbiased opinion of the claims of homoeopathy."

The Conflict of Science and Society. By C. D. Darlington, F.R.S. (Pp. 51. 2s.) London: Watts. 1948.

The 1948 Conway Memorial Lecture.

Recent Advances in Surgery. By H. C. Edwards, C.B.E., M.S., F.R.C.S. 3rd ed. (Pp. 437. 24s.) London: Churchill. 1948.

An account of modern surgical practice.

Constitutional Medicine, Endocrinology and Allergy. Edited by E. Pulay, M.D., and P. Lansel, M.D. Vols. 2, 3, and 4. (Pp. 102, 63, and 112. 10s. 6d. each.) London: Muller. 1948.

Papers by various authorities.

Psychiatrie et Psychologie. By M. Assailly and others. (Pp. 47. 145 francs.) Paris: Administration Synthèse et Thérapeutique. 1948.

Papers on various aspects of medical psychology.

Diseases Affecting the Vulva. By Elizabeth Hunt, B.A., M.D., Ch.B. 3rd ed. (Pp. 211. 25s.) London: Kimpton. 1948.

Much new material on treatment has been added.

Hemoglobin, Plasma Protein, and Cell Protein. By G. H. Whipple, M.D. (Pp. 27. 7s. 6d.) Illinois: Thomas. 1948.

A monograph on the production and interchange of these proteins.

Fungus Diseases of the Lungs. By David T. Smith, M.D. (Pp. 59. 10s. 6d.) Illinois: Thomas. 1948.

A monograph, with references.

Nutrition and Hormones. By Leo T. Samuels, Ph.D. (Pp. 48 8s. 6d.) Illinois: Thomas. 1948

A monograph on the relation between the endocrine glands and nutrition.

Embryonic Sex Hormones and Sexual Differentiation. By Carl R Moore, Ph.D. (Pp. 81. 10s. 6d.) Illinois: Thomas. 1948.

The experimental effects of sex hormones.

Pain. By Harold G. Wolff, M.D., and Stewart Wolf, M.D. (Pp. 86. 10s. 6d.) Illinois: Thomas. 1948.

A discussion of various types of pain in man

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PENICILLIN IN THE TREATMENT OF SYPHILIS

When in 1943 Mahoney showed that syphilitic chancres healed rapidly under treatment with penicillin many hoped that here at last was the *therapia sterilisans magna*. Penicillin was hailed with the same joy as was salvarsan, but when relapses began to occur some disillusionment soon followed, just as happened after Ehrlich's discovery. The immediate tendency was to increase the total dose and shorten the intervals between injections in order to counteract the rapid excretion of penicillin when injected in watery solution. Dosage rose rapidly from a total of 60,000 to 1,200,000 units, given over a period of 7½ days. The U.S. military authorities adopted double the latter dose as the standard treatment for early syphilis. For the more recalcitrant forms of the disease much larger doses were used, till 10,000,000 units or more were often given in relapsing or late syphilis. Almost from the first, on the analogy of combining mercury or bismuth with arsenic, official British policy was to give arsenic and bismuth as well as penicillin in all forms of syphilis. It is surprising that in the U.S.A., up to 1947, the official[1] treatment of sero-negative primary and early latent syphilis was only 3 mega units of penicillin, and of sero-positive primary, late latent, tertiary, mucocutaneous, osseous, ocular, cardiovascular, and congenital types, 6 mega units.

Various methods of delaying the absorption or excretion of penicillin and so maintaining a constant effective level in the blood have been introduced from time to time. The advantage of these is that with wide spacing of injections the patient can be treated as an out-patient, whereas when injections have to be given every two or three hours over a period of a week or more the patient must occupy a hospital bed. A policy midway between these two—e.g., the giving of very large doses once or twice daily, has been advocated by some[2 3] and appears to give satisfactory results. Opinions differ regarding the relative efficacy of the three methods. Ingraham *et al.*[4] consider penicillin in oil–wax mixtures as effective as aqueous solutions in the treatment of syphilitic pregnant women; Moore[5] also believes that the oil–wax preparation is quite as good as the aqueous, but Marshall[6] prefers aqueous solutions for all forms of syphilis. Not enough reports of patients treated with penicillin in absorption-delaying vehicles have been published for the two methods to be properly compared. As yet the use of substances which delay the excretion of penicillin is still in the experimental stage.

Strict comparisons between different treatment schedules will not be practicable until pure crystalline penicillin G is available. Moore[7] has estimated that aqueous penicillin, given according to various schedules, fails to cure early syphilis in 25 to 35% of cases within an observation period of 18 to 24 months; Lourie,[8] using two or three massive doses, reports satisfactory results at the end of 12 to 18 months in 87.5% of primary sero-positive cases and in 76% of secondary cases; British Army figures showed failure rates after 12 months, using 2.4 mega units, of 14% for sero-negative primary cases, 13% for sero-positive primary cases, and 17.5% for secondary cases. It will be seen from these figures that results vary considerably. In general it may be said that the earlier treatment with penicillin is started the better are the results, as would be expected.

Penicillin is remarkably effective in preventing congenital syphilis; thus Speiser *et al.*[9] report 95% of healthy babies born to treated syphilitic pregnant women, even though some of these latter were not treated till very late in pregnancy. Yet it appears that though the child is healthy the mother is not necessarily cured. The results in infantile congenital syphilis are also excellent provided the child survives the treatment. No spectacular results have been obtained in cardiovascular syphilis; as to whether Herxheimer reactions are to be feared opinions differ, but it is generally agreed that it is wise to start treatment with very small doses.

Penicillin appears to be more effective in all forms of neurosyphilis than any drug hitherto employed, though naturally results are better in the benign forms than in tabes or general paresis, and obviously it cannot restore dead brain cells or nerve fibres. This subject was fully discussed by J. P. Martin[10] in a paper which appeared in the *Journal* recently; he thinks that penicillin alone is adequate for the treatment of most types of neurosyphilis, and that even in G.P.I. malaria therapy is seldom necessary. Worster-Drought,[11] on the other hand, recommends the addition of arsenic, bismuth, and artificial fever in all late forms of neurosyphilis, whilst Lescher and Richards[12] suggest that all patients with late latent neurosyphilis should receive both penicillin and malaria.

Opinion in Great Britain seems generally against relying on penicillin alone in any form of syphilis, and most syphilologists employ both arsenic and bismuth as well. McElligott,[13] for early syphilis, starts with these two drugs, giving twelve injections at four-day intervals and introducing penicillin on the tenth day of treatment. In the Army no patient receives less than 4 mega units of penicillin with 5.85 g. of neoarsphenamine and 2.0 g. of bismuth. Unfortunately the assessment of results so far obtained in the treatment of syphilis with penicillin is rendered difficult by the fact that different samples of penicillin vary in their content; of the four varieties, F, G, X, and K, G is far superior to the others in treponemicidal effect, so that theoretically a pure crystalline G should be the ideal drug. On the other hand there are

[1] *Veterans Administration Technical Bulletin* (T.B. 10–24), Jan. 7, 1947; *J. Amer. med. Ass.*, 1947, **134**, 1535.
[2] Lourie, E. M., *Brit. J. vener. Dis.*, 1948, **24**, 11.
[3] Lloyd-Jones, T. R., *et al.*, ibid., 1945, **21**, 65.
[4] Ingraham, N. R., *et al.*, *J. vener. Dis. Inform.*, 1947, **28**, 155.
[5] Moore, J. E., *Brit. J. vener. Dis.*, 1948, **24**, 1.
[6] Marshall, J., *The Venereal Diseases*, 1948. Macmillan, London.
[7] Moore, J. E., *Penicillin in Syphilis*, 1948. Blackwell, Oxford.
[8] Lourie, E. M., *Brit. J. vener. Dis.*, 1948, **24**, 11.
[9] Speiser, M., *et al.*, *J. vener. Dis. Inform.*, 1947, **28**, 108.
[10] Martin, J. P., *British Medical Journal*, 1948, **1**, 922.
[11] Worster-Drought, C., ibid., 1947, **2**, 559.
[12] Lescher, F. G., and Richards, H. R. M., ibid., 1947, **2**, 565.
[13] McElligott, G. L. M., *Brit. J. vener. Dis.*, 1948, **24**, 9.

those who believe that some of the impurities present in most preparations have a considerable therapeutic value; certainly it was a fairly uniform opinion in the U.S.A. that after April, 1945, results tended to become poorer and poorer and that this may have been due to a preponderance of penicillin K, which is relatively ineffective against the spirochaete. In spite of its excellent effect on signs and symptoms it seems at least doubtful if penicillin is as effective in reversing positive serum reactions as a combination of arsenic and bismuth; whether this is of great importance is a matter of opinion, but most of us, and patients too, are encouraged by a regular and rapid fall in the titre of positive reactions, and in latent syphilis this is the only yardstick by which the effect of treatment can be measured.

Much remains to be learnt about the penicillin treatment of syphilis: whether a continuous moderate blood concentration is better than a series of peaks, whether one heavy course is as good as several moderate ones, and whether and when courses should be repeated (in the absence of signs of serological or clinical relapse). Most relapses in early syphilis occur within six months of completion of treatment, so that it would seem reasonable, when relying on penicillin alone, to give a second course within three months or so of the first, just as has been the custom with arsenic and bismuth in the past. As to the effect of penicillin in late syphilis few would care to express an opinion; time alone will show, and it will be five years at least before we know whether those patients treated for early syphilis with penicillin only are going to develop such late manifestations as tabes and G.P.I. The one great advantage of penicillin is the absence of serious side effects. Apart from Herxheimer reactions, which are very common but rarely serious, and urticaria, which is uncommon and seldom an indication for discontinuance of treatment, there are no contraindications to its use, and doses may be stepped up to very high levels, though it seems doubtful whether such doses are ever necessary. Methods of treatment are still being frequently changed, and the wise syphilologist will keep an open mind till some general agreement is reached.

OSTEOARTHRITIS OF THE HIP-JOINT

Osteoarthritis of the hip-joint commonly has as its starting-point a congenital malformation, a developmental abnormality of childhood and adolescence, or a traumatic lesion. Physical treatment is an important palliative measure, but cannot result in cure. Injection into the joint of various fluids intended to modify the chemical reactions of the synovia has aroused interest, but as yet there are no carefully documented reports of the long-term effects in any considerable series of cases. Surgery will therefore continue to play a large part in the relief of pain, the correction of deformity, and the restoration of mobility.

For single osteoarthritic hips, arthrodesis has generally been accepted in Great Britain hitherto as the most reliable method of treating intractable pain and correcting deformity, and for this purpose the two-stage method of Watson-Jones[1] has gained in popularity. Arthrodesis sacrifices joint mobility but allows much greater activity because of the relief of pain and deformity. In a case of bilateral osteoarthritis of the hip the restoration of mobility in one or both joints is a pressing additional necessity. Valuable recent reports on reconstruction operations have been published by Bristow,[2] McMurray,[3] Plewes,[4] and Girdlestone.[5] More or less wide excision of the femoral head, while often sacrificing stability, has given relief of pain and increased mobility. McMurray's operation of realigning the weight distribution by intertrochanteric osteotomy gives benefit also by correcting the deformity, though without improving movement at the joint. Fresh interest has been aroused in the reconstruction of osteoarthritic hip-joints by the report given by Smith-Petersen[6] at Exeter to the British Orthopaedic Association on the results of his arthroplasty operation, first described[7] in 1939. In the past the effects of arthroplasty have often been vitiated in these cases by shock, by infection, and by new bone formation around the newly constructed joint. Smith-Petersen employs an antero-lateral approach which is practically bloodless, and by meticulous care and gentleness of handling gains easy access to every component of the articulation. The acetabulum and femoral head are reshaped with specially designed tools and the capsule and synovial membrane are widely excised. A suitably shaped cup of vitallium or of 18/8 stainless steel is then inserted. The operation is followed by a carefully planned programme of after-care. It should be stated that there are surgeons in this country who prefer to use the original Murphy lateral approach with elevation of the great trochanter. They claim that muscular re-education is easier and that by avoiding the wide denudation of the ilium they minimize the risks of new bone formation.

Herman Gade[8] has now reviewed the whole problem of osteoarthritis of the hip-joint, and he describes 130 operations of various kinds carried out by him in Norway between 1938 and 1946 on 115 patients. Among these operations are 12 involving total excision of the capsule, 14 arthroplasties by the Smith-Petersen vitallium cup method, 49 operations "combining both these procedures," 7 arthroplastic resections without the insertion of a cup, and 27 arthrodeses. It is a little difficult to understand the reason for Gade's separation of the "combined operation." Excision of the capsule and synovial membrane of the hip-joint is an essential feature of Smith-Petersen's arthroplasty, as it was indeed of the original fascial arthroplasty described by Murphy many years ago.[9] The synovial membrane and capsule of the hip-joint both play an important part in the symptomatology of osteoarthritis, a fact that has been stressed by Tavernier[10] and his associates at Lyons, who have advocated a denervation operation for this reason.

In evaluating operative results the clinical assessment of functional restoration is difficult. Ferguson and Howarth[11] measured the total normal range of hip movements in degrees and multiplied this figure by a factor which gave an index of 100. The range of movements in a stiff hip multiplied by the same factor gave a percentage figure. Along similar lines Gade uses a different factor for different sectors of each direction in the range of movement at the hip, and provides an index of functional value which

is interesting, though it must be rather more complicated to apply. In 54 cases in which cup arthroplasty was performed the average age was 45, and the follow-up period averaged nearly four years after operation. Where the capsule was not excised relief of pain was obtained in 41% of cases, as compared with 78% of those in which there was capsular excision. In the first group the functional result was assessed at 56%, with a post-operative gain of 20%, while in those cases with capsular excision as well the figure was 66%, with a post-operative gain of 28%. An important late finding was atrophy of the bone ends (both acetabulum and femoral head), which Gade attributes to pressure from the metal cup. This change was seen more frequently where the joint surfaces were atrophic at operation. In 34 of the 54 cases there was some degree of new bone formation around the cup, in 8 of them to such a degree as to affect the results adversely. Gade concludes that in relieving pain and increasing mobility Smith-Petersen's cup arthroplasty with capsular excision yields results which have probably never been bettered by any previously used method of arthroplasty. Commenting upon the large number of cases operated upon by this method and the paucity of reported results, Gade says that this is probably due to the fact that such results can only be estimated after long observation. He applies this to his own work and will not commit himself to a final opinion upon the likely duration of his results, in which the most serious complication, he suggests, is atrophy of the bone ends.

Those surgeons in Great Britain who are following Smith-Petersen's technique of cup arthroplasty are clear that relief of pain is a most satisfactory and early result, and that correction of the deformity is complete without any additional operation. They will also agree with Gade that the range of movement obtained depends on painstaking care in after-treatment. The competence of the muscular apparatus of the hip before operation has an important bearing on the probable result. Smith-Petersen has emphasized repeatedly the need for operation before muscular degeneration has proceeded too far. For this reason Smith-Petersen himself has operated on some of the very early cases of osteoarthritis seen in young adults suffering, for example, from the effects of imperfect reduction of congenital dislocation of the hip. Encouraging as his early reports seem to be, it is obviously going to be many years before a true assessment can be given. There remain two problems in the successful surgical reconstruction of the osteoarthritic hip. First there is the difficulty of re-establishing an efficient local neuromuscular system, and, secondly, there is the later difficulty of maintaining biologically what has been achieved temporarily as a mechanical compromise. How long will the local equilibrium remain undisturbed by the presence of a foreign body?

[1] *Proc. roy. Soc. Med.*, 1945, **38**, 363.
[2] *Ann. Surg.*, 1934, **100**, 1043.
[3] *Brit. J. Surg.*, 1935, **22**, 716.
[4] Ibid., 1940, **27**, 682.
[5] *Proc. roy. Soc. Med.*, 1945, **38**, 363.
[6] Shortly to be published in *J. Bone Jt Surg.* (British Section).
[7] *J. Bone Jt Surg.*, 1939, **21**, 269.
[8] *Acta chir. scand.*, 1946, **45**, Suppt. 120.
[9] *Ann. Surg.*, 1913, **57**, 593.
[10] *Traitement Chirurgical de l'Arthrite Sèche de la Hanche*, Paris, Masson, 1945.
[11] *J. Amer. med. Ass.*, 1931, **97**, 1867.

REMUNERATION OF GENERAL PRACTITIONERS

In a letter on this subject in last week's issue of the *Journal* (p. 110) it was estimated that the proposals for remuneration under the National Health Service might result in a loss to a group of local practitioners of more than 50% of their present income from general practice. The group comprises ten general practitioners in a rural area with a population of 10,000, and in each of these practices the income received from the present panel capitation fees amounts to less than one-quarter of the gross receipts. The estimated loss is based on the assumption that the capitation fee will be about 15s. The capitation fee will be the main source of public remuneration for general practitioners, but certain additional payments may be overlooked in making comparisons between present and future prospects.

The Government's proposals provide for the establishment of a central fund of some £40.8 million, which corresponds to a capitation fee of 18s. for 95% of the civilian population. To the extent to which the proportion of the population signing on a doctor's list is less than 95% the capitation fee—disregarding basic salary—per person on a doctor's list will be higher than 17s. 5d. (i.e., 18s. less the mileage apportionment). This central fund will provide in the first place for payments for mileage. The sum allocated for this purpose is £1.3 million as compared with the pre-war mileage fund of £250,000 and the existing mileage fund of approximately £600,000. It will also provide a fixed annual payment of £300 a year in those few cases in which this is applicable, and the remainder will be distributed to each executive council for local distribution in the form of a capitation fee for each person on each doctor's list.

Apart from this central fund, however, there will be an additional amount to be distributed of over £4 million, or approximately £200 per general practitioner in the Service. Furthermore, over and above the capitation fee there will be available to general practitioners income from any one or more of the following sources: (1) The sum of £400,000 a year will be available for providing discretionary extra "inducement" payments to assist doctors practising in "peculiarly difficult (e.g., sparsely populated or unpopular) areas." The Minister will consult the Medical Practices Committee on the distribution of this sum. (2) There will be a grant for supervision of the training of assistants amounting to £150 per annum. (3) Fees for maternity services: seven guineas a case will be paid for maternity services to practitioners on the "obstetric list" and five guineas a case for practitioners not on the list. (4) There will be additional payments in respect of drugs and appliances which a doctor is required to supply on the spot. The rate will be 2s. 6d. per annum (or more in certain years) for every 100 persons on the doctor's list. (5) Where the doctor dispenses by arrangement with the executive council payments for drugs, etc., will be made either on the basis of the actual drugs and appliances he supplies or at a flat rate per annum in respect of each person on his list, with additional payments for specially expensive items. (6) The Government superannuation contribution of 8% of the net remuneration of each general practitioner must be taken into account. (7) Sessional fees from local health authorities will be paid—for example, for clinic appointments. (8) General practitioners may provide general medical care as members of the staff of a hospital in the following capacities: (*a*) as one of the staff of a general practitioner ("cottage") hospital; (*b*) as the part-time medical officer of a convalescent home or other institution. For these appointments remuneration will be received

from the hospital management committee. (9) Fees from private practice will continue. In addition the practitioner will receive yearly 2¼% interest on the capital value of his practice as estimated for the purpose of compensation.

THE SHORT OESOPHAGUS

Rare diseases are apt to become more common when their possibility is kept in mind, and this is particularly true of hiatus hernia, short oesophagus, and the peptic ulceration of the oesophagus commonly associated with it. The protean manifestations of oesophageal hiatus hernia provide a common ground for many specialists. Obscure cases of anaemia, unexplained haematemesis, dyspepsia of all degrees from heartburn or "wind in the stomach" to intense boring pain related to meals, dysphagia, pain simulating angina but not related to exercise, breathlessness, and cough may all be the result of herniation of the stomach through the oesophageal orifice of the diaphragm. Unless the radiologist considers the possibility of the condition he may miss it by using routine radiological technique, and it is therefore the physician's responsibility to draw his attention to it.

There are two types of hernia: those with a short oesophagus and a pouch of stomach drawn up into the chest, and those with an oesophagus of normal length and herniation of part of the fundus of the stomach. It has been assumed that short oesophagus was a primary developmental error in its caudal passage, the stomach failing to reach the sanctuary of the abdomen before the fusion of the diaphragm. On the other hand, herniation with a full-length oesophagus was thought to be due to a primary defect of the diaphragm. It has been recognized that peptic ulcer of the oesophagus is particularly associated with the short oesophagus, and Dick and Hurst[1] demonstrated the ease with which gastric juice regurgitates through the vertical opening between the short oesophagus and the gastric pouch. Regurgitation is less apt to occur when the opening through the cardia is normally oblique and the oesophagus of full length. The division of aetiological responsibility between developmental error of the diaphragm and faulty descent of the oesophagus and stomach has recently been discussed. Allison, Johnstone, and Royce[2] pointed out that peptic ulcer of the oesophagus, if it persists for any length of time, is associated with shortening of the oesophagus from cicatricial contracture, as occurs with the "purse stringing" of the lesser curve from gastric ulceration. Gilbert, Day, and Rall[3] consider that shortening from spasm of the longitudinal coat of the oesophagus from a vago-vagal reflex may be responsible for the drawing up of a gastric pouch. Experiments on dogs and rabbits have shown such shortening after vagal stimulation, and the same result was obtained by stimulation of the peritoneum, distension of the gall-bladder, and manual distension of the stomach wall. Vagal section or administration of atropine abolished the reflex. They draw attention to the apparently high proportion of intra-abdominal lesions which may be associated with hiatus hernia. The weakness in their clinical argument is the lack of a control series in the corresponding age groups, and it may be suspected that cholelithiasis, obesity, and duodenal ulcer are found as often in people without an oesophageal hiatus hernia.

The conceptual unity of the mechanism of short oesophagus and hiatus hernia has been propounded by Smithers[4] and by Allison[5] in his recent admirable paper on peptic ulcer of the oesophagus. After careful study of 63 patients Allison maintains that short oesophagus is usually an acquired condition due to defects in the diaphragm which allow an intermittent or persistent herniation of the stomach into the thorax. This facilitates regurgitation of acid gastric juice into the oesophagus, leading to peptic oesophagitis or peptic ulceration; the cicatricial reaction causes further shortening of the oesophagus. Smithers believes that spasm of the longitudinal muscle fibres is particularly important. A natural weakness of the oesophageal hiatus may be aggravated by increasing abdominal pressure from obesity, or by atrophic changes in muscle with advancing years. Fifty-six of the 63 cases were in fact over 50 years of age. During inspiration the negative suction in the chest and the positive pressure in the abdomen both increase, so there is a natural tendency for the cardia to be drawn upwards or, alternatively, for the stomach contents to pass into the oesophagus. But it is at this time that the crural fibres contract round the lower end of the oesophagus, closing its lumen and normally preventing herniation. The muscular contraction is not equal in all directions, being strongest at the sides, moderate in front, and weakest behind—a point of great importance in relation to operative repair of the hernia. Although Allison admits that a true failure of longitudinal development of the oesophagus may occur, it must be exceptionally rare, and for practical purposes cases of hiatal hernia and short oesophagus, with or without ulceration, may be considered as due to a primary defect of the diaphragm.

The logical application of this viewpoint is to use a more radical surgery to cure the deformity, which may allow acid to regurgitate into the oesophagus causing oesophagitis and ulceration. In most cases symptoms are not sufficiently severe to justify operation, but there are a few that may be greatly benefited by either repair of the orifice or excision of the cicatrized area. Repair of the hernia was undertaken in 9 of the 63 cases in Allison's series, and a further 5 had excision of the ulcerated and badly stenosed oesophagus with anastomosis to the jejunum.

[1] Dick, R. C. S., and Hurst, A., *Quart. J. Med.*, 1942, **11**, 105.
[2] Allison, P. R., Johnstone, A. S., and Royce, G. B., *J. thorac. Surg.*, 1943, **12**, 432.
[3] Gilbert, N. C., Dey, F. L., and Rall, J. E., *J. Amer. med. Ass.*, 1946, **132**, 132.
[4] Smithers, D. W., *Brit. J. Radiol.*, 1945, **18**, 199.
[5] Allison, P. R., *Thorax*, 1948, **3**, 20.

NODULAR DEFENSIVE REACTIONS OF THE SKIN

The "trisymptomatic malady of Gougerot" is a characteristic skin reaction which consists of three well-defined lesions—erythematous papules from 2–10 mm. in diameter, resembling most often erythema multiforme or sometimes urticaria; purpuric macules from 1–5 mm.; and small firm nodules from 2–7 mm., varying in their depth in the skin. Gougerot[1] has recorded six cases. The lesions come out in crops over the whole body, but especially on the lower limbs, and disappear in 15–60 days, usually without any scarring. The condition persists for years and may be symptomless or associated with very occasional pyrexia, headache, and joint pains. The general health is fair, though the patient may gradually lose weight and feel fatigued. Histologically, the lesions are situated in the dermis and there is obvious swelling of the endothelium of the capillaries, which are surrounded by a sleeve of fibrinoid necrosis and marked polymorphonuclear infiltration. Despite extensive studies no pathogenic agent has been found in either the blood or the tissues.

Gougerot suggests that this syndrome is one of a large series of skin reactions which are caused by organisms establishing themselves in a sensitized skin. They vary from acute necrotic tuberculides to the lesions described above, and include other tuberculides and "pityriasis lichenoides varioliformis acuta." He has labelled them nodular dermal "allergides." Closely related to them are Osler's

[1] *Sem. Hôp. Paris*, 1947, **23**, 1311.

nodes, which are associated with severe endocarditis; here Gougerot believes the cutaneous defence reaction is inadequate. Numerous pathogens may cause these nodular dermal "allergides," including the tubercle bacillus, pyogenic cocci, and, less often, Hansen's bacillus, gonococci, trichophyton, and other organisms known and unknown. He considers that it is justifiable to group these reactions together, as they all entail the same allergic process, which he calls the nodular defensive reaction. Not only does he think the skin is the site of this reaction but he suggests that it takes an active part in defence against organisms by complex mechanisms and notably by tissue secretions.

While a relation between many of these conditions can be seen, it is probably spreading the net of allergy too wide to include such lesions as Osler's nodes unless we are to assume that all inflammatory processes are allergic. There is moreover insufficient evidence that organisms occur in the blood in such a condition as erythema multiforme, even in the six cases which Gougerot has himself described. It would be more helpful to isolate conditions in which the aetiology is known than to group together large numbers of eruptions in which the pathogenic causes can only be surmised. It is unjustifiable to assume that the lack of resistance in endocarditis with Osler's nodes is due to failure of the skin defence mechanism, and it is usually considered that the cutaneous reaction of a tuberculide is an indication of a good resistance and not the cause of it.

GIANT HYPERTROPHIC GASTRITIS

The normal gastric mucosa is subject to wide variation, both between different people and in the same person at different times. Only changes in its gastroscopic or radiological appearances that are constant, or, if inconstant, when accompanied by symptoms, can be regarded as pathological. Giant hypertrophy of the gastric mucosa fulfils these criteria. It is a rare condition, and in reporting six new cases Maimon[1] and his associates refer to fewer than fifty cases reported in the literature.

There is no constant clinical picture, but all six patients had epigastric discomfort. One patient had had a severe haematemesis; this has occurred in other cases, and Bourne[2] has reported in Britain an example in a man who had severe anaemia. Radiologically the rugae are prominent and rigid; collections of barium between the elevations of the mucosa give the impression of multiple polyps, and in some cases true polyps may occur, as Sprigg[3] has shown. Gastroscopically the appearance varies, but usually the dull red oedematous and infiltrated folds can be seen; there may be superficial ulceration, and in all cases the distinction from carcinoma may be impossible. Macroscopically the rugae are seen to be enlarged and tightly packed together, so that the resemblance to the cerebral convolutions may be striking; sessile polyps may also be present. Microscopically, redundancy of the mucosa with marked hypertrophy of the glandular structures are the outstanding features. In some areas there may be cyst formation, with metaplasia to the intestinal type of epithelium.

Little is known of the aetiology of the condition. It is uncertain whether the cause is inflammation, and the condition would therefore be better given the descriptive name of giant hypertrophy of the gastric mucosa rather than giant hypertrophic gastritis. Its importance lies in its relationship to carcinoma, for it has been suggested that it may be a precursor of a neoplastic change, but this again is not certain. What is certain is that both gastroscopically and radiologically it may be impossible to differentiate between this condition and carcinoma of the stomach. Gastrectomy is therefore the treatment of choice.

[1] Maimon, S. N., Bartlett, J. P., Humphreys, E. M., Palmer, W. L., *Gastroenterology*, 1947, **8**, 397.
[2] Bourne, W. A., *Proc. R. Soc. Med.*, 1948, **41**, 43.
[3] Sprigg, E., *Quart. J. Med.*, 1943, **36**, 1.

COLOUR TERMINOLOGY

The publication of a report on colour terminology by a committee of the Colour Group of the Physical Society[1] marks the end of an inquiry which has been proceeding since 1941. The compilers have gone beyond the accepted uses of colour in physiology and colour physics and have attempted, first, to collect information on existing usages in a variety of industries, and secondly to decide on the minimum changes necessary to secure a consistent terminology that could be used by all colour workers. Physiology, as might perhaps be expected, comes well out of this scrutiny. The terms used to describe deficiencies of colour vision are definable in terms of experimentally determined characteristics, and though associated historically with the Young–Helmholtz theory of colour vision they will probably remain undisturbed by such work as, for example, that of Prof. Hartridge on the reality of a fourth and separate yellow-sensation.

It is rather in usages regarded as normal or "everyday" that some degree of restraint is required from professional men, as was lately shown by the Colour Group at the expense of visitors to the Physical Society's Exhibition. Confronted with one particular colour sequence and asked to describe the quality in which there was variation, just under one thousand visitors proposed between them some 43 different terms. As an example, the word "shade" may be used in at least four different senses. It is used in ordinary speech to mean any colour, by the dyer as a synonym for hue (the subjective equivalent of dominant wavelength), in the paint industry to describe a small variation in "tone" from another colour, and, correctly, by the printer for the shadow effect given by a darker colour of the same hue and saturation as another. Tone and brightness provide other examples of uncertain meaning, and in the case of the latter it is proposed that the colour physicist should himself promote understanding by giving way. Unquestionably when we refer to the brightness of our neighbour's front door we have in mind not merely the intensity of the light which is scattered from its surface but also the vividness of its colour. Apart from this general and almost instinctive use the matcher of dyestuffs uses brightness to describe the opposite of that dullness which results from the addition to any colour of a small quantity of a neutral grey. It is proposed, therefore, that the physicist should renounce his use of this term and that the word "luminance," already proposed for the objective measurement of luminous intensity, should be joined by "luminosity" as the corresponding subjective term to indicate "intensity of luminous sensation."

It would be well for mutual understanding if the committee's recommendations could be generally followed, for the number of changes required of individual users is comparatively small. In place of 230 existing usages it is suggested that 60 should suffice for unambiguous description "throughout science and industry."

On July 8 Lord Webb-Johnson was re-elected President of the Royal College of Surgeons of England for the eighth successive year.

[1] Published by the Physical Society. (Pp. 56. 7s.)

HOSPITAL ADMINISTRATION IN AMERICA

REPORT TO KING EDWARD'S HOSPITAL FUND

Capt. J. E. Stone, who lately undertook a tour of the hospitals of the United States and Canada on behalf of King Edward's Hospital Fund for London, has presented to the Fund a report on some of the latest ideas and devices in hospital administration and equipment which he discovered on the other side.

His general impressions are that the hospitals in the large cities of America are much bigger and more massive in appearance than those in Britain. The majority are of the multi-storied type, not because of limitations of ground space, but to reduce horizontal travel. He specially noted the large, light, and lofty entrance halls, some of them bigger than our own out-patient departments, and conveying a feeling of welcome often absent from British hospitals, even modern ones. A visitors' lounge, comfortably furnished with armchairs and small tables and decorated with flowers, often opens off the main entrance.

The popular building material is glass bricks, which increase the lighting without loss of privacy. Stainless steel is chosen for equipment everywhere. If an item can be obtained in this material no other will serve. All kinds of devices are used for saving labour—dictaphones, stenotyping machines, electric typewriters, pneumatic tubes for carrying documents, the tel-autograph system for the transmission of messages, electric scrapers, polishers, and the like.

The public wards are rather larger in America than is customary in Britain, but there is now a tendency towards smaller ones and to a division of the original almost square ward into several compartments by the use of curtains. Three types of accommodation are commonly provided: private (single-bed rooms), semi-private (two-bed rooms), and general or public wards (10 to 26 beds). The majority of patients are able to pay for their maintenance, and because of this the proportion of private bed accommodation is relatively high in practically all hospitals, accounting for a quarter or a third of the total bed accommodation. An increasing number of people are making provision for hospital care by means of an organization which corresponds to British contributory schemes. Staff is plentiful except for nurses. The nursing position in America appears to be similar to that in Britain.

Hospital Bed Ratios

The method of calculating the number of beds required for a given area has been worked out in New York as a result of an analysis which shows that for the past ten years an average of 120 patient-days of general hospital care has been provided for each death occurring in the city. From this a formula has been developed which indicates that 0.41 general hospital beds should be available for each death occurring in one year in a population group.

The U.S. Public Health Service recommends the following as adequate:

General hospitals: 5.5 beds per 1,000 population (or from 3.5 per 1,000 in sparsely populated areas).
Chronic disease hospitals: 2 beds per 1,000.
Mental hospitals: 5 beds per 1,000.
Tuberculosis hospitals: based on the average annual death-rate from tuberculosis.
Public Health centres: 1 per 30,000 population (or up to 1 per 20,000 in States with fewer than 12 persons to the square mile).

The authorities are very definite that no hospital should exceed 1,000 beds; the majority place the maximum at 700 to 800.

Several American authorities expressed the opinion that the day of the isolated specialist hospital is over, and that if these hospitals are to render efficient service in the future they must work in close association with medical centres of general hospitals. The tendency is towards making the large general hospital complete in every respect so far as all specialties are concerned. A large number of hospitals in country districts are of the 100-bed class, all voluntary, and all complete in the sense that they meet the needs of all classes, providing private rooms and public wards.

It is estimated that from 5 to 15% of the beds in a general hospital should be for children. The Americans lay stress on the individual care needed by children to protect them from cross-infection.

The following points among others are laid down in connexion with the siting of hospitals:

Ample parking space, present and prospective.
Good light in adjacent roads.
Avoidance of noise from highways, railroads, playing grounds.
Avoidance of insect-infested areas.
If there are industrial smokes in the vicinity the hospital must be out of line of prevailing winds.
A cemetery should not be visible from the hospital.

One of the minimum standard requirements for hospitals desirous of approval by the American College of Surgeons is that the hospital should provide a clinical laboratory giving a complete and properly supervised service. This laboratory is expected to be able to cope with the essential examinations immediately necessary in assisting the clinician in making or confirming his diagnosis—e.g., urine analysis, blood counts, smears, sputum examinations, and spinal-fluid counts. The American hospitals, both large and small, are proud of their laboratories, which are generally well equipped and adequately staffed.

Operating-theatres

It is generally agreed that there should be one operating-theatre for every 40 or 50 surgical beds. In small hospitals there should be one major and one minor operating-theatre in addition to an emergency room in the admission department. Generally the standard lay-out comprises twin theatres with a "scrub-up" between them, and a sterilizing-room similarly placed. Opinions differ as to the provision of anaesthetic rooms; some hospitals have dispensed with them. In one hospital the operating-theatre unit consists of seven theatres ingeniously arranged around a central work area, economizing space, time, and effort. The entrance for patients is from an outside corridor, thus avoiding cross traffic, and there are no anaesthetic-rooms. It is estimated that the theatre floor space should be approximately 30 to 40 square metres.

The use of fluorescent lighting from lamps fixed to the theatre ceiling is proving satisfactory. The arrangement of the centre light is such as to allow the air to escape above it and so keep the theatre cool. A floor- or pedestal-lamp is often used for additional illumination. For contagious disease units some hospitals are using ultra-violet sterilization lamps pre-operatively in the operation theatre.

To minimize risk of anaesthetic explosions, most theatre floors are of terrazzo, with metal (not vulcanite) grids to dissipate static ceiling electricity, and noiseless, sparkless electric mercury switches are in general use. At one hospital the surgeons and theatre staff have aluminium incorporated in the soles of their shoes.

In one operating-theatre an arrangement is made for students and visitors to sit in a semicircular glass-enclosed dome almost directly above the operation table, and a radio device enables the surgeon to carry on a conversation with those in the enclosed area outside the actual theatre.

Some hospitals maintain an individual supply of instruments for each operating-theatre as against a central instrument-room. The equipment seen was first class. Locked cabinets were recessed and flush with the walls. Sponge and swab racks for easy and accurate counting were in general use. The scrub sinks, three for each pair of theatres, were of the splashless type, and the flow of water was regulated by knee or foot control. An alcohol hand-bath adjoined the sink in most cases. In some hospitals no sinks are used in the scrub-up—merely an anti-splash board supported obliquely against the wall, the water draining into a shallow gutter.

In America recovery wards or rooms are favoured. The advantages are twofold: the patient receives greater protection because the highly trained nurses are obviously better fitted—and such wards better equipped—to cope with early post-operative complications and emergencies, and the nurses in the surgical wards are relieved of the strain of major nursing at this most anxious period. The recovery ward has oxygen and every apparatus for emergency. Generally there are three or four recovery beds for each major theatre.

The Nursing Unit

The ideal nursing unit in America is considered to comprise between 20 and 30 beds. The determining factor is the number of patients the night nurse can properly care for; the head nurse during the day hours will have as many assistants as are needed. The number of patients in such a unit is variously estimated at from 18 to 22 in single rooms, 20 to 30 in two-bed rooms, and a maximum of 40 in four-bed or large rooms. The U.S. Public Health Service holds that the nursing unit should normally consist of 25 beds if mixed (that is, private, semi-private, and ward), 30 if all ward patients, and 20 if all private-room patients. A larger proportion of single rooms gives a more flexible unit, simplifies complete isolation, aids in the distribution of patients by sex, and helps to avoid the presence of conflicting personalities or noisy or obnoxious cases in the same room or wards.

Nowhere in the United States did Capt. Stone find any hospital authority desiring more than six beds for a general or public ward; in Canada the number is six to eight. Two-bed rooms are out of favour owing to the difficulty of selecting congenial companions, and three-bed rooms are also not liked because of the possibility of two patients combining against the third. The four-bed ward makes it easier for the sister to select psychologically compatible people. The general opinion is that beds are best placed parallel with the outer wall, free on two sides and at the foot end, in such a way that the patient does not have to face the window.

The ideal bed light has not yet been evolved even in America—by "ideal" is meant a light shaded sufficiently to be of no inconvenience to other patients in the room, and to allow maximum light for the reader in a convenient position. Some hospitals have installed a direct-call system from every bed to the nurses' station, the patient being able to talk into a bed telephone and the nurse to reply at a distance. The nurses' station is separate for each unit, in a good central position for over-all supervision, and convenient for all avenues of approach. Patients' records are generally kept in the nurses' station. In some hospitals each nursing unit has its own treatment room, containing examination table or couch, supply and instrument cupboards, instrument sterilizer, and washing facilities.

Out-patient and Other Departments

The out-patient arrangements do not differ very much from the British pattern. The appointment system is fairly general. Departments are well marked with directing signs, and there is an information bureau to assist patients. Many hospitals have a food clinic in the out-patient department, with a view to instructing patients how best to carry out the dietary orders of the doctor.

The maternity section is separated from the other sections of the hospital. In the 15 years ending 1944, 73.1% of all births in the United States occurred in hospitals, and approximately 12% of all admissions were for confinements. It is considered that there should be one labour-room for every ten patients, and one delivery-room to every 20 maternity beds. Generally the babies are viewed through glass, the visitor standing in a corridor or recess. In American hospitals admission to the nursery is forbidden to all except the nurses, who scrub and gown before entering. Doctors scrub, mask, and gown before making examinations.

There are many other features of American hospitals worthy of comment. Food is transported in specially designed trolleys, generally heated by electricity, with hot and cold compartments well insulated from one another. Every hospital which Capt. Stone visited had a blood bank. Wiring for all *x*-ray equipment is separate from the general wiring system of the hospital. The use of the viewing-box with glass top-light flush with the surface of a table saves much time and effort for the nurses in sorting *x*-ray films and putting them in their folders and containers. For hospital floors sheet linoleum bedded on linoleum felt (on a concrete base) is much used; terrazzo is also used in corridors. Rubber floors are difficult to keep clean, and cork is not often seen. One feature of American hospitals is a conversation-room for confidential conversations with relatives, doctors, or ministers of religion. The patients are wheeled in and interviewed in their beds.

All hospital authorities insist that bedpans and urinals should be of stainless steel. Capt. Stone was told of an innovation which was first introduced at the Southern Hospital, Stockholm. This is a special room called the enema-room for each nursing unit. Patients are wheeled in on their beds for ordinary bowel evacuation or for enemas and washouts. The idea underlying the arrangement is that anything obnoxious should, wherever possible, be kept away from the patient's bedroom, or, in other words, his living-room.

Courses in Hospital Administration

Eight universities in the United States and one in Canada (Toronto) have established courses in hospital administration. A division of hospital administration has been established in the school of public health of the faculty of medicine at Columbia.

The American Medical Association, through its Council of Medical Education, concerns itself with the training of medical record librarians. The training consists of not less than 50 weeks of theoretical instruction and practical hospital experience. Hospital records, by the way, are generally kept for twenty years, after which they are micro-filmed and destroyed; the micro-films take up about one-tenth of the space of the records.

The certificate of approval granted by the American College of Surgeons on the recommendation of its committee on hospital standardization is regarded as an important mark of achievement by the hospitals of America and Canada. For the purpose of conferring approval the College maintains a permanent staff of field representatives who are graduates of medical schools and have had experience of clinical work and of hospital administration. This task of approval was undertaken by the College in a desire to advance the standards of surgery laid down for its Fellowship. It was found that few graduates could meet its requirements because so few hospitals were in a position to give their surgeons facilities for the proper pre-operative study of their patients. To remedy this unsatisfactory state of affairs the College prepared and published its minimum standard and introduced its certificate of approval. The standard has no legal enforcement, but the public has been educated to expect it of hospitals.

BRITISH TUBERCULOSIS ASSOCIATION

ANNUAL CONFERENCE

The annual conference of the British Tuberculosis Association was held in Belfast on June 30, July 1, and July 2, with the president, Dr. Frederick Heaf, in the chair.

Dr. Brice Clarke, director of tuberculosis services under the Northern Ireland tuberculosis authority, gave an outline of the tuberculosis problem and mentioned the schemes in operation and those being planned for the control of the disease. The annual number of deaths was 1,100, and the total number of beds available was 1,200; 700 additional beds were being planned and of these 250 would be ready in about a year. The policy of the authority was to have all the beds in special chest hospitals or in units of general hospitals, so that patients would always have access to any treatment they required. The clinic and mass radiography services were to be extended, and it was hoped later to make some tuberculin surveys and statistical analyses.

Professor Arvid Wallgren (Stockholm) spoke on the "Time Table of Tuberculosis." He said that primary infection with tuberculosis was in the large majority of cases benign and without significance. In certain cases where resistance was low, or other factors were involved, a serious primary infection occurred, and by careful observation of the patients the various phases of the infection could be followed. The incubation period before tuberculin sensitivity developed was usually five to six weeks. Occasionally erythema nodosum, and more commonly "initial fever," marked the end of the incubation period. The second phase he considered to be the three months following the development of sensitivity. This was the period of haematogenous dissemination and was the most dangerous. Miliary spread and meningitis were most common in this phase. The third phase was from the third to the seventh month, and this he called the pleurisy phase. He mentioned that it was rare for meningitis to follow pleurisy. After the seventh month the third or latent phase was entered, and during this period the lesion tended to heal, though bone lesions sometimes developed. Healing of the primary lesion was usual in the second or third

year after infection. Most of the bony lesions occurred in the first year. These phases applied to primary tuberculosis in all age groups, but age played an important part in influencing the nature of the disease. He instanced the rarity of phthisis in young children and the relative frequency of meningitis. In adolescents or young adults phthisis was common and meningitis rare, though there were many exceptions to these generalizations.

Dr. Dorothy Price (Dublin) described the results of B.C.G. vaccination of a group of infant contacts. In this group there had been no deaths from tuberculosis during a period of ten years. The vaccine was given by the intradermal method, originally in a single dose, but more recently in three doses. No adenitis occurred and only a slight local reaction. The infants were kept in hospital for six weeks before vaccination to enable those already infected to be detected. They were retained in hospital after vaccination till tuberculin sensitivity was established. In children who had had a serious primary infection with tuberculosis a marked reduction in the death rate had been obtained during the last few years by early diagnosis and prolonged bed rest. Recently, a short course of streptomycin had been tried in these cases.

Para-aminosalicylic Acid

Professor Jorgen Lehmann (Gothenburg) described the treatment of pulmonary tuberculosis with para-aminosalicylic acid. In a large series of cases, many of them with advanced disease, improvement was noted in more than 50%. The most striking effect was an improvement in general well-being coinciding with an increase in weight, raised haemoglobin, and a fall in the blood sedimentation rate. Improvement in the radiological appearances was seen in the exudative type of disease, but in the more chronic cases cavities were little affected. The treatment, however, made it possible for many of these cases to have coincident or subsequent collapse therapy. Toxic effects were not usual, though some patients had had vomiting and diarrhoea. The drug was given orally in doses of 14 g. daily (for an adult) divided into four or six doses. It was rapidly absorbed and excreted and a blood concentration of 3 to 6 mg. per ml. should be maintained. Treatment could be continued for several months, and bacterial resistance to the drug did not occur. The blood sedimentation rate was the most sensitive indicator for the management of treatment.

Dr. T. G. Dempsey (London) gave an account of 20 cases of tuberculous empyema treated with intrapleural P.A.S. Of these 8 had broncho-pleural fistulae and were a less favourable group. Better results were obtained in the 12 non-fistula cases, and a sterile fluid was achieved in 11 of them after twelve weeks' treatment. There was considerable improvement in the general condition, and some of the cases became suitable for thoracoplasty. In 6 cases the pleural space was obliterated. The speaker pointed out that procaine should not be used as a local analgesic with P.A.S. Sinuses in the chest wall healed rapidly after P.A.S. therapy was started. A small series of cases of pulmonary tuberculosis was treated with oral P.A.S. The dose given was 20–30 g. per day. Results were most striking in the pneumonic and miliary cases; sputum conversion depended on cavity closure. Apart from nausea, no toxic signs were noted and the sodium salt appeared to cause even less upset.

Dr. A. F. Foster-Carter (Frimley Sanatorium) dealt with the segments of the lungs. He described their anatomical formation and their importance in disease of the lung. Tuberculous disease was not commonly confined to a segment of the lung. Other segments nearly always showed infiltration. If the area involved was segmental in distribution in a proved case of tuberculosis, tuberculous bronchitis with stenosis should be suspected. Segmental lesions occurred in primary tuberculosis, as for example in epituberculosis.

Dr. Dillwyn Thomas (Sully Hospital) described a method of treatment of cavities by antipostural drainage. If the cavity were prevented from emptying in many cases it would not be visible after one or two months. Immobilization of the patient in a suitable position was essential and strict and constant nursing care was needed. Thoracoplasty was done on some of the patients after a period of immobilization.

Mr. J. H. Carver (London) spoke on silent renal tuberculosis. He described a group of cases in which the usual symptoms of renal tuberculosis were absent. The condition was due to occlusion of the ureter so that the bladder remained unaffected and the urine normal. The kidney might become greatly enlarged and the symptoms might suggest gastric or colonic disease. The diagnosis was made by intravenous pyelography, and the treatment was nephrectomy. Tuberculosis was present elsewhere in the body in almost all these cases.

Thoracoplasty

Dr. Johann Gravesen (Copenhagen) described the operation of combined apical thoracoplasty with extrapleural pneumo-oleothorax, which he had used for several years. He emphasized the need for conservation of healthy lung tissue. The apicolysis introduced by Semb had been a great advance, but sometimes the mobilized apex expanded again and cavities reopened. To prevent this the speaker had performed a very limited thoracoplasty with an extrapleural pneumo- or oleothorax. Extrapleural pneumothorax was dangerous where cavities were superficial, and in these cases the mobilization was done extrafascially. Very careful haemostasis of the wound space was needed and clot formation must be prevented. The space was first filled with air and after two or three weeks with oil.

Dr. Joseph Smart (London) spoke of the dyspnoea which followed thoracoplasty operations when pulmonary efficiency was impaired. Pulmonary function was difficult to assess accurately. Bronchospirometry measured the function of each lung separately and therefore had certain advantages, but it had the disadvantage that the patient must be at rest during the test and was breathing under difficulties. A more accurate assessment could be made by combining the exercise tolerance test with bronchospirometry, particularly in emphysematous patients. Marked impairment of function of one lung could be caused by obliteration of the pleural space, and also by phrenic nerve interruption. In certain cases there was less impairment of function after thoracoplasty than after artificial pneumothorax. The pneumonic type of disease, superficial cavities, and endotracheal tuberculosis were all contraindications to artificial pneumothorax, and treatment by primary thoracoplasty was preferable when these conditions were present.

Mr. W. P. Cleland (London) in a paper on primary thoracoplasty emphasized the contraindications to A.P. mentioned by Dr. Smart. He deprecated attempts at adhesion section in cases with "ballooned" cavities and advised thoracoplasty instead. Certain types of disease needed the maintenance of a permanent collapse and for these also thoracoplasty was indicated. The age and occupation of the patient must be considered. Very good results had been obtained in endobronchial tuberculosis with streptomycin treatment. Stenosis of the bronchus sometimes made it necessary to perform a lobectomy.

Dr. James Deeny (Dublin) described his personal experience of the epidemiology of tuberculosis in two medium-sized towns in Northern Ireland over a period of twenty-five years. He showed how many minor and severe epidemics developed from single cases in small areas of these towns. Ten or eleven deaths in five years were traced to a single focus. The effects of bad housing and poverty were variable. Spread of infection by direct contact was particularly dangerous to adolescents.

Dr. J. E. Wolf (Davos) discussed the treatment of pulmonary tuberculosis with streptomycin. He had treated 96 cases in the past three years. The results had been most favourable in the more acute forms of the disease, particularly the miliary and bronchopneumonic forms. The results in the chronic fibroid cases were less good, but some improvement was effected. Doses were 1 g. or less per day, and continuous treatment for three months at least was to be preferred to intermittent administration of the drug. Laryngeal, tracheobronchial, and enteric forms of the disease were greatly benefited by streptomycin. Resistance developed in some of the infecting organisms, and a second or third course of treatment was less effective than the first. Treatment after such resistance had developed was harmful in some patients. Toxic effects were not common; vestibular disturbance cleared up when the treatment was discontinued. Another toxic manifestation noticed was loss of memory for recent events, but this also cleared up after a few weeks' rest from treatment. The toxic effects he believed were due to impurities, and he had found that changing from the preparation of one manufacturer to that of another

relieved the toxic symptoms. He spoke of the diminution of toxaemia shown by all the patients treated, but was emphatic that early cases who were doing well should not be given streptomycin. The drug was most valuable in certain forms of the disease, but the standard treatment by rest and collapse therapy must not be abandoned.

Dr. Johannes Holm (Copenhagen) was unfortunately unable to attend to read his paper on "refined methods of search for tubercle bacilli."

THE NATIONAL HEALTH SERVICE AND THE DEAF

Mr. Bevan on the National Hearing-aid

The annual general meeting of the National Institute for the Deaf, which was held in London under the chairmanship of the Duke of Montrose on July 7, was addressed by the Minister of Health.

In the course of his remarks Mr. Aneurin Bevan said that not until now had the deaf had statutory recognition. He believed that the word "deaf" had never appeared in a British statute before the National Health Service Act. The local authorities were responsible for looking after handicapped persons, including, of course, the deaf and dumb. It was decided when the scheme was framed that the care of handicapped persons should reside with the local authority because the service was a personal one, varying in its demands from place to place, and a national scheme would not be sufficiently flexible and adaptable for the purpose. It would be his task to see that the local authorities did their job. It was intended that the widest possible interpretation would be given to the word "workshop," for example, in the rehabilitation proposals, in order to retain in the general community those suffering from this and other handicaps.

The hearing-aid illustrated an aspect of the service to which too little attention was apt to be paid. What the new Act did was to establish people's rights or entitlement. The coming into existence of the service must depend upon the resources available, and recently the production of the hearing-aid had lagged behind expectation. A few snags had been discovered, and they had had to wait until certain technical difficulties had been overcome. The production of the aid had depended upon various techniques, some of which were developed and perfected during the war, and now a sensitive mechanism had been provided which he hoped would be of great assistance to the hard-of-hearing. Certain criticisms had been made, chiefly that the aid was not handsome in appearance. But the important thing was its efficiency, and at the same time the question of cost could not be ignored. The batteries were large, so that the instrument tended to be heavy, but if smaller batteries had been put in they would have required more frequent renewal, and therefore would have been more expensive. In connexion with this problem of the deaf they had to bear in mind that hundreds and thousands of people who had been living in solitude would be brought again into social intercourse and made not only happier and more contented but enabled to do useful work. He also looked forward to the development of research to find out more about the causes of deafness and how they could be forestalled.

At the same meeting the Chairman of the National Institute, Mr. R. Scott Stevenson, said that the Institute had sought for years to have a hearing-aid brought within the range of poor people in this country. The new Government hearing-aid was an excellent job. It was the nearest approach possible to a universal aid, and for the kind of deafness that could be helped by a hearing-aid it was as good as could be got. It was a mistake to emphasize smallness of size in a hearing-aid; efficiency was wanted, not prettiness. There was, of course, a psychological element in the choice of a hearing-aid. In a recent visit to three or four rehabilitation centres in the United States he had found the central individual to be, not an otologist, nor an educationist, but a psychologist. In America great stress was laid on auditory training, and in this country the fullest benefit would not be got out of the Government hearing-aid unless it was combined with a period of training.

Lord Leverhulme said that it was estimated that 150,000 people were eligible for hearing-aids. It should be remembered that the provision of the aid would benefit not only those with impaired hearing but those with normal hearing also, making possible or easier the give-and-take of ordinary business and social intercourse.

The annual report of the Institute, which was adopted at the meeting, described a volume of useful and varied work done on a wholly insufficient income of about £6,500.

A New Sound-reinforcement System

The hall of the National Institute for the Deaf, at 105, Gower Street, has been equipped with a new sound-reinforcement system—a system designed to give the most powerful and flexible aid to gatherings of the hard-of-hearing. The system embodies, among other technical contrivances, three microphones, and as many individual headphones and bone-conduction receivers as there are people in the audience requiring them. A wide range of frequency response is provided, and flexible tone-control arrangements permit of amplification of the particular frequencies needed for different kinds of deafness. At a demonstration the value of the installation was tested for ordinary speech and discussion and general conversation or "committee talk"; to the normal-hearing person the amplification, though too loud for comfort, in no way distorted the sound, and the many deaf people who tested it expressed themselves delighted with the result. A feature of the system is a roving microphone which enables the audience to participate in any discussion. It is claimed that the system, the installation of which has cost the Institute about £500, makes this small hall—the Leo Bonn Memorial Hall—the most useful and up-to-date meeting-place for the hard-of-hearing anywhere in this country.

MATERNITY AND CHILD WELFARE

Encouraging Statistics

The annual conference arranged by the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality was held recently in London, when the general theme was the State and family life. Dr. Jane Turnbull, opening the conference as chairman of the Association, remarked on the general feeling that notwithstanding the new social legislation voluntary work had still an important part to play. It was an encouraging indication to that effect that out of 145 county and county borough councils just over half were affiliated to the Association and 28 of them had joined since the passing of the National Health Service Act.

The Minister of Health, the Rt. Hon. Aneurin Bevan, who was president of the conference, gave an address in which he said again, as he has often done in recent utterances, that trouble was to be expected once the National Health Service Act was launched. For some years it would not be possible to say that the Service had reached maturity. It must always appear to be inadequate. Although he was more conscious than most people of what was lacking on July 5 he believed the Service was starting with almost universal good will, and before many years were over we should look back with pride upon what had been accomplished.

In the field of public health, said Mr. Bevan, contributions were made from a thousand different sources, and each in itself tended to be regarded as comparatively unimportant, yet in their sum they produced the progressive improvement in vital statistics which was now being witnessed and improvements in environmental health generally. The latest statistics showed another decline in the infant mortality rate—41 per thousand live births in 1947, as compared with 43 in 1946. The stillbirth rate in 1947 was 24 per thousand, as compared with 27 the previous year, and the maternal mortality rate 1.17, as compared with 1.43. All these statistics, including the birth rate, which showed an increase, proved that the sap of vitality was flowing freely in the British oak.

In addition to the refurbishing of the health organization a great deal of interesting legislation had been put through Parliament. One measure now passing through the Lords was the Day Nurseries and Child-minders Bill. Good as this legislation was, it must never be forgotten that communal care for the child could not replace parental care. He had been a little afraid lest so much emphasis be laid upon collective activities

that the primary thing, parental relationship, might be forgotten. That was why he had attached so much importance to good housing.

Finally Mr. Bevan spoke of the need for maintaining voluntary organizations. The intervention of the State into the world of hospitals and social services was not for the purpose of destroying the spirit of voluntary organization but of emancipating it from the necessity for spending so much time in the mere collection of money. In the National Health Service Act the skeleton was State organization, but the flesh was voluntary effort.

A Charter for Children

The conference discussed the National Health Service Act as it affected young children, environmental factors in the life of the child, and the effect of the Children Bill. In an exposition of this latest "Children's Charter" Mr. John Ross, Assistant Under-Secretary of State in charge of the Children's Department, Home Office, said that local authorities had a duty to receive into their care any child in need in their area; they were enabled to make any reasonable provision for that child, including further education up to university standard to the age of 21 and beyond; they were enabled to use voluntary homes for the accommodation of children; they would have some responsibility for the care of children in voluntary homes; and by their training schemes, administered under direct control of the Secretary of State with the immediate help of local authorities throughout the country, it was hoped to provide staff who would be able to care for these children in an adequate, sympathetic, and affectionate way.

Mr. John Edwards, M.P., Parliamentary Secretary, Ministry of Health, said that the smaller local authorities, although they would no longer have the responsibility that they had in the past in regard to maternity and child welfare, must not think that there was no longer a place for them in the Service. Some of the larger authorities would not be able to do this work properly unless they had the day-to-day help of the smaller authorities.

COUNTY BOROUGH MEDICAL OFFICERS

Annual Meeting

The annual meeting and conference of the County Borough Medical Officers of Health Group of the Society of Medical Officers of Health was held at the Aberdare Hall, Cathays Park, Cardiff, from Friday, July 2, until Monday, July 5. By invitation of the Group's president, Dr. J. Greenwood Wilson, the medical officer of health for Cardiff, some fifty members of the Group attended and enjoyed a varied programme. The first event was the inaugural dinner on Friday evening. The president welcomed the guests, who included the Lord Mayor of Cardiff (Alderman R. G. Robinson, J.P.), Sir Frederick Rees (Principal of the University College of South Wales and Monmouthshire), Professor R. M. F. Picken (Provost of the Welsh National School of Medicine), Dr. Arthur Massey (Chief Medical Officer, Ministry of National Insurance), Dr. A. R. Culley (Principal Medical Officer of the Welsh Board of Health), and Dr. Trevor Jones (Senior Administrative Medical Officer of the Welsh Regional Hospital Board). The company heard some excellent speeches in reply from the Lord Mayor, Sir Frederick Rees, and Professor Picken. After dinner there followed the annual meeting of the Group and a discussion opened by Dr. E. K. Macdonald (M.O.H., Leicester), who took as the title of his paper "The Fragments that Remain."

On the Saturday morning many members of the Group took the opportunity of visiting coal mines in the Merthyr Valley and seeing the work which was being done on the control of dust. They were entertained to luncheon at the City Hall by the Lord Mayor and returned to Llandough Hospital to hear an address by Dr. Charles Fletcher, director of the Medical Research Council's Pneumoconiosis Research Unit.

At the Temple of Peace on Sunday morning, July 4, Sir Frederick Rees gave an address on post-war planning in Wales and briefly reviewed the considerations which had been taken into account by the Boundary Commissioners. Later that morning the Group heard a description of the Cardiff scheme for the follow-up of ex-hospital patients suffering from such conditions as diabetes, asthma, and peptic ulcer. The speakers were Dr. D. A. Williams, Mr. D. B. E. Foster, and the health visitor, Miss Mary Davies. In the afternoon the party paid a visit to the Welsh National Museum, through which they were conducted by Dr. North, director of the Geological Section. After tea the Group discussed medico-political matters, and after dinner they again met to hear an interesting paper on the regional hospital board and the medical officer of health by Dr. W. G. Patterson, senior administrative medical officer of No. 1 (Newcastle-upon-Tyne) Region. The discussion on this paper continued until a fairly late hour. The meeting concluded with a vote of thanks to the president for his arrangements, and to all those who had helped, including a number of medical students who had acted as stewards at the Aberdare Hall for the three days.

REPORT OF SIMS COMMONWEALTH PROFESSOR

Australasian Tour of Sir Hugh Cairns

Sir Hugh Cairns, the first Sims Commonwealth Professor to be appointed, travelled to Australia in December, 1947, and after a short visit there spent a month in New Zealand and then two months in Australia. He has now presented his report.* He lectured on the work done by himself and his colleagues at Oxford, the titles of his lectures including "Blunt Head Injuries and Their Effects," "The Late Results of Gunshot Wounds of the Head," and "The Treatment of Tuberculous Meningitis by Streptomycin." He also delivered the Annual Syme Oration of the Royal Australasian College of Surgeons and the Lister Oration of the South Australia Branch of the B.M.A. In the second half of the tour he gave a number of clinical demonstrations for students or house-men, which were followed by general discussion, and he found that it was an excellent way of meeting all the clinical members of the hospital. At Adelaide and Sydney he discussed methods of clinical teaching with the honorary staffs of teaching hospitals, and in Adelaide answered questions from a number of young graduates about work in Britain.

He comments in his report on the general dissatisfaction in Australia and New Zealand on the number of postgraduate surgical examinations that are commonly taken. Most of them take the primary and final F.R.C.S., the final F.R.A.C.S., and the primary and final M.S. Since these examinations are very similar, many people believe that young men are wasting valuable time "pot hunting." It is thought that when young surgeons come to Britain they should spend their time working with British surgeons or in research rather than in attending classes for the primary and final F.R.C.S. Australasian surgeons value their fellowships of the English College and their connexions with it, and the R.A.C.S. is therefore considering having its own primary examination (there is none at present, the primary M.S. or F.R.C.S. being accepted); it may then ask the English College to agree to reciprocity between the two primary examinations. Alternatively, the R.A.C.S. may ask for a combined primary F.R.C.S. and F.R.A.C.S. to be held annually in Australia. In any case, they do not want to discourage men from taking the English examination.

Sir Hugh Cairns points out that there are departments in Australia and New Zealand where work of the first order is carried out. They are splendidly equipped and accustomed to training young men of outstanding ability, but with few exceptions there are no clinical departments with facilities for training postgraduate students. He suggests therefore that postgraduate medical fellowships might be established for British students to work in suitable departments in Australasia. Ultimately there might be free exchange of teachers and research workers between all parts of the British Commonwealth. These fellowships should be for training in research and technical methods and be tenable for two years, the fellows holding permanent appointments in Britain from which they could be seconded.

Apparently the title "Commonwealth Travelling Professor" misled many people in Australia into thinking that it signified a professor who was travelling around the Commonwealth of Australia. To avoid ambiguity Sir Hugh Cairns suggests that it might be changed to "Sims British Commonwealth Travelling Professor" if the trust deed permits.

*Report to the Presidents of the Royal College of Physicians of London, the Royal College of Surgeons of England, and the Royal College of Physicians and Royal College of Surgeons of Australasia.

ONE HUNDRED AND SIXTEENTH ANNUAL MEETING

of the

British Medical Association

HELD AT CAMBRIDGE, JUNE, 1948

THE SECTIONS

SUMMARY OF PROCEEDINGS

In subsequent issues there will be printed in the BRITISH MEDICAL JOURNAL *a few of the opening papers read at the Scientific Sections. All the papers will be published in full in a separate volume of Proceedings. The reports of the discussions, concluded from last week (p. 104), are intended to give members who were not present a general idea of the proceedings.*

SECTION OF OTO-RHINO-LARYNGOLOGY

Wednesday, June 30

The Sphenoidal Sinus

With the president, Mr. V. E. Negus, in the chair, Dr. Arthur W. Proetz (St. Louis, Missouri) read a paper on the sphenoidal sinus. With the posterior ethmoid and sphenoid sinuses it was often a case of "out of sight, out of mind." Inferences drawn from examination of the anterior sinuses were not necessarily correct. In contact with this sphenoid sinus were thirteen important structures, separated only by the thinnest bone, and sometimes even that was absent. The sphenoidal face and ostium were out of the line of inspired air, so there was no tendency to drying, except in atrophic conditions. Air exchange through the ostium was negligible, so that glands were relatively sparse. Sagittal section showed that the lining mucosa, very thin and adherent, merged with the thicker and looser nasal mucosa at the very rim of the ostium. Inflammatory blocking was therefore due solely to the nasal mucosa and could be relieved by shrinking the nasal mucosa outside the sinus. There was practically no tendency to polyposis, but an obliterative swelling did occasionally occur in allergy. Mucosal changes in chronic infections were reversible for much longer than was generally supposed. Jonathan Wright pointed this out in 1914, and showed that cilia persisted in a surprising manner.

In conservative treatment Dr. Proetz favoured mild vasoconstrictors, such as "tuamine" or 0.25% ephedrine, introduced by displacement. In operating, the ostium must be carefully preserved, as it was the point to which all ciliary streams converged. A new slit-like ostium should be medial to the old one. He now treated conservatively two-thirds of the patients on whom he would originally have operated, and found he got better results.

Mr. F. C. W. Capps (London) dwelt on the clinical aspect. He said we tended to conservatism in this country. The sphenoid was well protected from air-borne and fluid-borne infections, and was therefore the least often infected of all the nasal sinuses. He emphasized the aid given by good radiographs in making a diagnosis of sphenoiditis. In twenty-five years' experience he had had only two cases of acute sphenoiditis, both treated successfully by immediate drainage. In chronic infections only the ethmoid sinuses need be drained. In his experience there was no direct connexion between sphenoiditis and retrobulbar neuritis. In treating malignant disease affecting this sinus diathermy plus irradiation gave the best results. In conservative treatment in children he preferred postural instillation of ephedrine to actual displacement.

The president, Mr. Negus, congratulated Dr. Proetz on his masterly paper. He felt that the sphenoid should not be regarded as a separate entity, but as one of the group of posterior ethmoids. He would like to know what was the relation, if any, of allergic swelling of the lining to migraine and of infection to mental disorders.

Mr. A. S. H. Walford (Cambridge) asked Dr. Proetz if it was permissible to probe the ostium, as, owing to asymmetry in sinus development, the new ostium might be made into the wrong side. Mr. J. C. Hogg (London) had no experience of primary acute sphenoiditis but had opened many sphenoids when treating chronic pansinusitis. It was often easy to pass a cannula into the sphenoid without disturbing the middle turbinate.

Mr. G. H. Bateman (London) was struck by the rarity in his experience of isolated sphenoidal sinusitis. Mr. Donald Watson (Bradford) had seen very few cases in Edinburgh, as had his old teacher, Mr. J. S. Fraser. He had seen cases of mental derangement cured by sphenoid drainage. Displacement, and menthol snuff, had given excellent results in children.

Mr. T. C. Graves (Birmingham) contended that there was a possible connexion between sphenoiditis and insanity. He stressed the importance of the sympathetic chain, and said that this might influence the cerebral vessels, and so the mental state. He described several cases showing dramatic improvement after sphenoid drainage. Mr. J. H. Otty (Aberdeen) was impressed by the rarity of isolated sphenoiditis. He himself had seen only two cases. Dr. J. W. D. Bull (London) described the radiological findings in two cases, one a mucocele of the sphenoid, the other a meningioma of the anterior clinoid process.

In reply Dr. Proetz agreed that it was necessary to remove the middle turbinate in fulminating cases, but in chronic cases the turbinate should be preserved. He warned against the use of cocaine and adrenaline in treatment, as they paralysed cilia in a matter of seconds. There was no objection to probing the ostium, nor to enlarging the latter, provided the entire sphenoidal face was not removed. He doubted if migraine was ever caused by allergic swelling of the sphenoid lining, and said he had no experience of mental cases, though he was much impressed by Dr. Pickworth's specimens. Radiologists should be encouraged to work with radio-opaque substances, and should always use standard positions of the head.

Mr. Capps, replying, said that by this discussion much of the aura of mystery by which the sphenoid had been surrounded had been dissipated. When he had used cocaine in treatment it had been only a 1% solution. In very acute cases one should use common sense in deciding the type of operation to employ, and in chronic cases all conservative measures should be tried first.

Poliomyelitis and Tonsillectomy

With the president, Mr. V. E. Negus, again in the chair for the afternoon session, Dr. Allan M. McFarlan (Cambridge) opened a discussion on poliomyelitis and tonsillectomy. He recounted the history of five children in one family who developed bulbar paralysis nine to fourteen days after tonsillectomy; three of them died. Many workers had noted a tendency for the bulbar type of paralysis to develop within thirty days of operation. Experiments on monkeys had shown that injection of virus into the tonsil region produced poliomyelitis, but spraying virus on the raw surface following tonsillectomy was ineffective. In man the pharynx was a favourite portal of entry. Absence of tonsils appeared to predispose towards the bulbar rather than the spinal type of paralysis. He admitted the risk was very small, but it was, of course, greater during epidemics. Symptomless virus infections were common, and there was no easy method of demonstrating them. Therefore the only safeguard was to avoid operations on the tonsils during an epidemic. He did not regard the risk as a contraindication to tonsillectomy in normal times.

Dr. J. Alison Glover (London) compared the risks of tonsillectomy during epidemics with those of postponing the operation, and suggested that the former was the greater risk. We should not know until late August or September if we were to have another epidemic this year. The virus was probably as widespread among the population as *Streptococcus pyogenes*. He quoted many authorities to show that the risk of bulbar palsy was much greater in tonsillectomized patients, and he contended that postponement of the operation last year had not caused any increase in respiratory tract infections.

Mr. Geoffrey H. Bateman (London) said that clinicians had refrained from operation during epidemics mainly because of

publicity. But the risk was extremely small, even at the height of the epidemic. The effect of the four months' break in operating in 1947 had been to add enormously to the waiting list. He thought parents were better judges than Dr. Glover of the harm caused to their children by such postponements. Surgeons would still stop operating during an epidemic, but he would still do so in urgent cases, particularly if there had been no immediate contact with proven cases, and if the child could be nursed in a cubicle.

The president, Mr. Negus, thought Dr. Glover was wrong in minimizing the ill effects of postponing operation, and that his figures applied to notifiable diseases only and not to minor ailments.

Mr. Donald Watson (Bradford) thought the chance of an epidemic this year was small. Operations for tonsils and adenoids were undertaken on the poorer type of children, in whom poliomyelitis would in any case be more prone to develop. He did not believe that there was no harm caused by postponing operation.

Mr. F. C. W. Capps asked why this operation was singled out. Were other operations on the head and neck, or even abdominal operations, to be postponed? Could carriers be recognized by an easy test, and was segregation likely to help? If the Ministry of Health advised when operations should be stopped they should also say when to start again.

Major-General E. A. Noyes (U.S. Army) said their practice during epidemics was to stop tonsillectomy operations on children unless there were overriding considerations. Mr. J. F. Lipscomb had seen many cases of poliomyelitis in Australia, where epidemics were prevalent. There operations were put off as soon as the figures for poliomyelitis began to rise. Poliomyelitis was no respecter of social grades. There was the same incidence among children carefully isolated by their parents as among the poorer ones who played together in the streets. Mr. J. C. Hogg asked if dental extractions carried any risks.

In reply Dr. McFarlan said that operations other than tonsillectomy appeared to have no bearing on the incidence of paralysis. There were contradictory statements about dental extractions. He thought it wise to isolate operation patients on general epidemiological grounds.

Dr. Alison Glover quoted an instance in which fatal bulbar paralysis developed after dental extractions. He agreed that cubicles were most desirable for tonsil cases, but thought that this measure would not prevent poliomyelitis from developing in cases in which there was a latent infection.

SECTIONS OF MEDICINE AND SURGERY

Thursday, July 1

Surgery in Hypertension

With Professor John McMichael (London) in the chair, Dr. R. H. Smithwick (U.S.A.) opened a discussion on the indications for and results of surgery in hypertension, and reviewed 256 cases followed for five to nine years. He said that most of the patients were treated by bilateral thoracico-lumbar ganglionectomy, with removal of the sympathetic chain from the eighth thoracic to the first lumbar ganglia inclusive and of the splanchnic nerves arising from that segment. Total thoracic (T2 to L1) and total (T2 to L3) sympathectomies were reserved for patients who had angina or unusual tachycardia in addition to hypertension, in order to denervate the heart as well as the splanchnic bed. The advantage of the thoracico-lumbar operation was that it permitted inspection and biopsy of the kidneys and examination of the adrenals. An adrenal tumour causing continuous hypertension was found in 5% of cases. The operation was performed in two stages, the second side ten days after the first. The operative fatality rate was 2%, with only a slightly higher rate in males than in females. In the series 40% of the patients were males, and the ages varied from under 10 years to over 60. Nearly 90% of the patients were between 20 and 49 years of age. Thirty-one per cent. of all patients died 5–9 years after operation. The 5–9-year mortality rate was specially high in patients under 20 and over 50 years of age, but the numbers in these groups were small and the figures probably not significant. The mortality rate varied also with the severity of the hypertension as measured by the diastolic pressure in recumbency; 65% of the patients with a sustained diastolic pressure of more than 140 died in the 5–9-year period. The mortality rate bore a direct relation also to the state of the cardiovascular system.

No patients whose hypertension had been complicated by congestive heart failure *and* poor renal function had survived nine years. Of the patients who had had congestive heart failure *or* poor renal function 53% died. Of those who had suffered cerebral incidents 39% died, and of patients with retinal haemorrhages and exudate and papilloedema 25–30% died. The causes of death in the 80 fatal cases had been cerebral accidents (48%), cardiac complication (23%), renal failure (16%), unrelated (10%), and unknown (4%).

The effect of the operation upon the various vascular areas after 5–9 years was as follows: (1) The retinal changes had been improved in 40%, unchanged in 39%, and worse in 20%. (2) The cardiac function, as measured by electrocardiogram, had been better in 42%, unchanged in 49%, and worse in 9%. (3) The renal function had been improved in 29%, unchanged in 61%, and worse in 10%.

The effect upon the diastolic pressure had been classified also. A marked effect had been a fall of 20 or more to below 90; a moderate effect had been a fall of 20 or more to less than 110; a slight effect had been a fall of 10–19 to below 110. In the first five-year period after operation there had been a marked fall in diastolic pressure in 35%, a moderate fall in 29%, a slight fall in 20%, no significant change in 11%, and an elevation in 5%. In the 5–9-year period these figures had been 21, 13, 13, 36, and 17 respectively. In other words, half the patients who seemed to be improved during the first five years after operation returned to the pre-operative level or higher in the second five years.

He had attempted to assess the mortality of untreated hypertension but had met great difficulty in doing this because of the variations in age and severity of disease from series to series. In a Swedish series 28% of untreated or medically treated patients had died in 4–11 years, in a Mayo clinic series 91%. Dr. Smithwick and Dr. Paul White had compared two series, treated and untreated, grouped according to fundus changes. The mortality was substantially lower in all the surgically treated groups. A similar benefit had been shown to be attained in the electrocardiograms.

Dr. Horace Evans (London) said that Dr. Smithwick had given a masterly review of his considerable experience of the subject. There was still a great lack of control data on which to assess the results of surgery. Bright had suggested that arterial hypertension was always a result of disease of the kidneys; later Allbutt had pointed out that many cases had no evidence of kidney disease; and finally Goldblatt had shown that renal ischaemia induced hypertension. He thought now that there was a clinical subdivision into essential and renal hypertension. In benign essential hypertension the cause of the disease was quite unpredictable, and in those cases it was difficult to evaluate the results of surgery. Women tolerated the disease better than men. In malignant and renal hypertension the cause was more certain, and that sympathectomy operations had an effect could not be doubted if the evidence of the hypertensive retinitis alone was considered.

Subsidence of the eye changes after the operation was sometimes quite remarkable. At the London Hospital at first only the most severe cases were operated on and it was hoped that renal changes might be reversible. However, it was found that a blood urea over 100 mg. per 100 ml. was a contraindication. Cardiac asthma was also an absolute contraindication. It was important that pre-operation assessment should be as complete as possible and be based on data including a diagram of the eye-fields, cardioscopy and electrocardiograms, and estimation of cerebrospinal fluid pressure. The physician would tend to choose the patient who showed unmistakable progressive hypertensive disease with cardiac stress and even early renal damage, into which group came some cases of Bright's disease; but the surgeon would wish to operate before there was irreversible arterial change. In spite of all these difficulties, and although he regarded the operation as a formidable procedure, he was sure it was worth attempting in younger patients, where the prognosis without operation was certainly unfavourable.

Mr. D. W. C. Northfield (London) analysed a series of 46 patients followed for upwards of six months. In the first few

years most of the patients had had malignant hypertension; subsequently benign cases with retinal changes, cardiac disturbance, or high diastolic pressure had been more commonly submitted to operation. More recently still, operation had been afforded to patients with chronic nephritis who had a high and rising blood pressure but no renal failure. In all cases asthma was a contraindication but infarction was not. A blood urea of over 100 mg. per 100 ml. was held to contraindicate operation except in patients of the nephritis group.

Forty-six patients were submitted to operation; there were eight operative and ten later deaths. The results were much worse in males than in females. Though there was frequent systemic relief, the effect on the blood pressure was disappointing, and the only objective improvement was in the fundi. Fundus changes, if present, resolved in all patients surviving three months, though in two of these patients dying later the fundus changes returned before death.

Dr. Rae Gilchrist (Edinburgh) said hypertension was the greatest medical problem of the day, being four times more common than cancer. He reviewed a group of 80 cases treated by medical means and followed up to five years and compared them with 42 patients treated surgically and followed for 8½ years. They were compared symptomatically and by repeated observations of the diastolic blood pressure, and by both methods the progress of the surgical cases was the more favourable. People with a diastolic pressure over 120 were not greatly influenced, and it was in the lower ranges that the very good results were obtained. He also spoke of a group of 30 cases of malignant hypertension followed for a period of two years. Twenty who had not been operated on were all dead, whereas of 10 treated by sympathectomy eight were alive, and one man who four years before had had papilloedema and could not work was now well and working and had married and had a son.

Dr. William Evans (London) thought it important to define hypertension, and suggested that the systolic blood pressure should be over 180, or the diastolic over 110, taken on at least three occasions. He also thought that before a patient had the operation the electrocardiograph should show a low T wave or inversion of the T wave, with RT depression in leads 1 and CR7. There was a great deal of invalidism caused by people being told they had hypertension which did not come up to these criteria.

Mr. F. E. Stock (Liverpool) said that the only hypertensive patients treated by splanchnicectomy in the surgical professorial unit at Liverpool who showed permanent improvement were those whose hypertension appeared to have originated in pre-eclampsia. The blood pressure in pre-eclamptics had been found to fall sharply after splanchnic procaine block, but it had not been found possible to effect a permanent reduction by alcohol or "proctocaine" block. Tetraethyl ammonium bromide given intravenously had had the same vasodilator effect as procaine block, but repeated intramuscular injections had been ineffective. Splanchnicectomy therefore seemed justifiable in patients with hypertension, particularly if performed in the second trimester, since post-operative miscarriage seemed a lesser risk than spontaneous miscarriage if the disease was allowed to proceed. Splanchnicectomy seemed specially justifiable in young female hypertensives, even in the absence of symptoms, with the hope of permitting pregnancy to go normally to full term.

Mr. A. Dickson Wright (London) advocated extensive bilateral sympathectomy by the transpleural route.

Dr. Smithwick in reply repeated his conviction that more benefit was obtained by a thoracico-lumbar sympathectomy (T8 to L1) than by a more extensive operation. A lower dissection was apt to be followed by severe postural hypotension and tachycardia. The lumbar chain was removed only in a few patients who had an unusual fall in the diastolic pressure in recumbency. Malignant hypertension even, in males though not in females, was sometimes associated with a return to a normal diastolic reading on recumbency. Total thoracic sympathectomy was reserved for hypertensives with tachycardia, but even in these it was unnecessary to dissect higher than T2 for a denervation of the heart. Three patients submitted to total sympathectomy had been badly incapacitated for years by postural hypotension.

To prevent cerebral and cardiac complications of operation he emphasized the importance of replacing the blood lost in mediastinal haematomas and pleural exudates; to determine this loss a haematocrit reading on the third day was invaluable. In hypertensive patients the presence of a pheochromocytoma of the adrenal was sometimes suggested even before operation by (1) severe postural hypotonia (as great almost as it usually is after operation); (2) tachycardia; (3) a basal metabolic rate of more than +20%; (4) unusual twitching; (5) hyperthermia or episodic pyrexia; and (6) pronounced response to the new adrenalytic agents—D.H.K. and benzodioxane, for example—which afforded a safer index of hyperadrenalinism than histamine injection did.

Dr. Horace Evans in reply said that Dr. Smithwick's reference to suprarenal tumours emphasized the need for accurate clinical assessment. He felt that Dr. William Evans's figures were too high and that he would not like to have a blood pressure of 180/110. He thought that the results of sympathectomy on patients whose hypertension developed during pregnancy were dramatic.

SECTION OF MEDICINE

Friday, July 2

Macrocytic Anaemias

With Dr. Branford Morgan (Norwich), a vice-president, in the chair, Sir Lionel Whitby (Cambridge) read a communication on "Pernicious Anaemia" from Professor George R. Minot (Boston, U.S.A.), who was to have opened the discussion but was prevented by illness. He said that the control of the hitherto fatal disease pernicious anaemia, which had been achieved in 1926, had happily abolished a dreadful urgency for discovering its cause. Soon thereafter a relationship of pernicious anaemia to defective digestion, surmised many years before by Coombe and by Austin Flint, had been established by Castle and his associates. This conception of a conditioned deficiency disease due to a specific disturbance of the gastric secretion and to defective absorption by the alimentary tract had been extended to include such macrocytic anaemias as those of sprue and of pregnancy. Recently von Bonsdorff had shown that the broad tapeworm might induce pernicious anaemia in persons already on the threshold of that disease apparently by inhibiting the scanty supply of enzyme remaining in their depleted gastric secretions. A few years ago Lucy Wills had shown that many patients with tropical macrocytic anaemia failed to respond to purified liver extracts of great potency. Because of the satisfactory response of these patients to relatively crude liver extracts it had then become clear that at least two substances active in human nutritional macrocytic anaemias, including pernicious anaemia, were present in mammalian liver.

The failure of early workers to isolate the active principle of liver had remained for twenty years a tantalizing challenge. Then quite unexpectedly a growth factor for the *Lactobacillus casei*, synthesized by Angier and his colleagues, had been discovered by Spies and his associates to be an active haematopoietic substance in pernicious and related macrocytic anaemias. Surprisingly enough, this substance, pteroylglutamic acid, was virtually lacking in purified effective preparations of liver extract, and to date, despite the acquisition of much knowledge of its natural occurrence in conjugated forms in food, the relationship between their precursors and the active principle of liver extract and pteroylglutamic acid had not been elucidated.

Guided by the discovery of Shorb that *Lactobacillus lactis Dorner* required a growth factor present in commercial liver extracts, Rickes and his associates had recently announced the isolation from liver of a substance crystallizing as small red needles and had designated it vitamin B_{12}. That material, according to clinical tests conducted by West, had been found to be haematopoietically active in pernicious anaemia in a single intramuscular injection of as little as 3 μg. Because of its extraordinary potency it could scarcely be doubted that that substance was in fact the active principle of liver effective in pernicious anaemia.

The paradox of the increased output of bile pigment despite convincing evidence of partial-maturation arrest of delivery of red cells to the circulation was well known. By feeding glycine containing isotopic nitrogen to a patient with pernicious

anaemia London and his associates had shown that in the first week of the observation about 50% of the isotopic nitrogen absorbed appeared in the stercobilin of the faeces. Because during this period few if any of the newly formed red cells of the peripheral blood containing isotopic nitrogen in their haemoglobin had been destroyed, those new facts were satisfactorily consistent with Whipple's surmise of a quarter-century ago that in pernicious anaemia stercobilin might be derived to a considerable extent from haemoglobin precursors before their incorporation into circulating red cells.

Sir Lionel Whitby then opened the discussion with a paper on "The Modern Management of Macrocytic Anaemias." The diagnosis of macrocytic anaemia was made by the integration of the laboratory work of the haematologist with clinical observation. Megalocytic anaemia arose from a megaloblastic erythropoeisis in the bone marrow, but it was not the only cause of macrocytosis. The methods of assessing macrocytosis were (1) colour index (but a colour index of less than 1 did not mean there was no macrocytosis); (2) halometry, which was unreliable when there was much anisocytosis; (3) the look of the film, which was only of value to those with great experience; (4) the Price-Jones procedure, which was an academic labour; and (5) undoubtedly the best method, the volume determination by Wintrobe tube. The proof that a megaloblastic marrow was present could be obtained by sternal puncture.

Macrocytic normoblastic anaemias occurred after acute blood loss, with disturbance of liver function, acute haemolytic anaemia, scurvy, myxoedema, steatorrhoea, and refractory anaemias due to toxic factors. It might also appear in primary dyscrasias such as leukaemia. In minor degrees it was present in subacute and chronic haemolytic anaemias, where a reticulocytosis in the circulating blood also occurred; and in acidosis such as that caused by renal failure.

With regard to treatment, there were available crude, purified, concentrated, and proteolysed liver extracts, and folic acid (pteroylglutamic acid). Each served its own purpose. Folic acid was of use in sprue, nutritional anaemias, and anaemias of pregnancy; it also had effect in Addisonian anaemias, but large doses often precipitated neurological symptoms. Liver, on the other hand, had a well-balanced action, though the mode of action of all the preparations was not clear. Clinical experience rather than pharmacological considerations should decide which preparation was used.

Professor J. F. Wilkinson (Manchester) said that in 19 years he had treated 1,600 cases of pernicious anaemia—68 before liver had been in use, of which 59 died within one year; 441 with stomach preparations; 513 with liver preparations; and 546 with both. In this series 301 had died with the usual diseases from which people of their age group suffered, only 47 being within a year of treatment; 100 of the living were quite well over the age of 80. He stressed the importance of diagnosis, which must precede treatment. Sufficient dosage and regular blood counts were essential. It was necessary to make sure that the extract was potent, since extracts were now made from livers which had been rejected as unfit for human food. Stomach preparations were better for cases that had spinal-cord changes, since they provided more of the principle and an ounce of protein as well. Folic acid had an extraordinary effect in bringing on acute cord symptoms, sometimes within 14 days. He had treated 20 patients with it, and 15 had developed these symptoms; of 184 cases described in the literature 66 had developed them. Small doses of the drug might not maintain the blood improvement.

Dr. C. C. Ungley (Newcastle-upon-Tyne) said that a red crystalline material isolated from liver by Lester Smith seemed identical with the vitamin B_{12} of American workers. The isolation of this substance had involved parallel clinical tests in over 100 patients with pernicious anaemia. The intramuscular injection of single doses of 10 μg. had been followed by maximal reticulocyte responses and a rapid increase of red cells. The red crystalline material itself had not been used long enough to permit assessment of its value in subacute combined degeneration. Preliminary observations had been made in cases of subacute combined degeneration using red-pigmented material containing colourless impurities. The rate of improvement in four cases had paralleled that seen in patients with crude liver extracts. The molecular weight of this substance was about 1,500.

In megaloblastic anaemias other than Addisonian anaemia the material would not necessarily prove effective. Thus, in a patient with megaloblastic anaemia of pregnancy there had been no response to the equivalent of 65 μg. although the patient had subsequently responded to 2.5 mg. of folic acid daily. The availability of the anti-pernicious-anaemia factor in a crystalline state would aid in disentangling the other haematopoietic factors present in yeast and crude liver extracts.

Dr. R. R. Bomford (London) said that the macrocytic anaemias associated with hypothyroidism still caused mistakes in diagnosis and management. The uncomplicated anaemia of hypothyroidism was never severe. The cells were enlarged, but there was no anisocytosis or poikilocytosis. Ths yellowish tint sometimes seen in the skin and in the plasma was due to lipochromes, which were soluble in petroleum ether, and not to bilirubin, which was soluble in alcohol; free acid might be present in the gastric juice. That anaemia responded very slowly to thyroid alone, and iron and liver were of no value. Sometimes hypothyroidism was associated with iron deficiency or with liver-factor deficiency, and in the treatment of these anaemias thyroid and iron or thyroid and liver extract, as the case might be, were necessary to produce a complete remission. When the clinical features of myxoedema were not prominent the uncomplicated anaemia of hypothyroidism might at first sight be taken for true pernicious anaemia. Mistakes could hardly occur, however, if proper investigations were made and the characteristics of the uncomplicated anaemia of hypothyroidism noted above were kept in mind.

Professor D. F. Cappell (Glasgow) stressed the superiority of marrow section over the smear method of examining sternal-puncture material.

Sir Lionel Whitby in reply thought that the kernel of the discussion was accurate diagnosis, and if this was not made at the outset the picture was for always obscured.

SECTION OF SURGERY

Friday, July 2

Carcinoma of the Breast

With the vice-president, Mr. P. H. R. Ghey (Cambridge), in the chair, Sir Cecil Wakeley (London) opened a discussion on carcinoma of the breast. He recollected that 7,500 women died yearly in England of this disease and that the presenting symptom was usually swelling or pain. Age was important in prognosis. Modern researches had demonstrated the fallacies in the older conceptions of lymphatic drainage from the breast. There appeared to be no grounds for the opinion that extension could occur from the axilla to the neck; the supraclavicular lymph nodes were affected only by way of intercostal and internal mammary lymphatic routes. It was wrong to believe also that drainage from the inner half of the breast was to internal mammary nodes in the upper spaces only; intercostal metastases were often found as low as the sixth intercostal space. Discussing the earliest signs of breast cancer he stressed the significance of a small swelling.

He preferred deep *x*-ray therapy as an adjuvant of operation rather than radium application. He then described the operative details of a modified Halsted operation. The clavicular head of the pectoralis major was left intact, since it afforded a screen for the axillary vein and prevented haematoma formation in the axilla. Post-operative bleeding was also reduced if the pectoralis minor was divided through its avascular tendinous insertion in the coracoid process rather than through its muscle fibres.

Nine cases of carcinoma of the male breast presented showed the retraction of the nipple which could occur in the male as in the female breast, and revealed the relatively high malignancy of cancer of the breast in males. Sir Cecil Wakeley concluded with a plea for standardization of *x*-ray therapy throughout the country. Dr. Frank Ellis (London) argued against the insertion of radium needles in the axilla and intercostal spaces, and proceeded then to consider the figures presented elsewhere by Dr. McWhirter. He questioned whether the Edinburgh cases treated in the second series (local mastectomy and *x* rays) were quite comparable with the earlier series (radical mastectomy

and *x* rays); the numbers were so much smaller in the former that certain Stage I cases may not have been referred for radiotherapy, with consequent reflection on the value of the more radical treatment. Dr. Ellis then showed by his own series from Sheffield on the one hand and the London Hospital on the other how seriously different local circumstances could disturb statistical results.

Mr. J. B. Oldham (Liverpool) urged the need for biopsy in any case of doubtful swelling in the breast of a woman over the age of 20. He had tried many methods of treatment in a long surgical career and had become confirmed in his attachment to radical mastectomy. He avoided the operation in lactating or pregnant women, in the presence of lymphoedema of the arm or of a large area of skin, and in the presence of supraclavicular swelling. Relatively localized cutaneous oedema, or attachment of glands to skin, or fixation of glands, or ulceration of skin was not, if alone, a contraindication to radical operation, but the presence of any two of these made operation of doubtful value. Like Sir Cecil Wakeley, he restricted his dissection to the area below the artery and vein, since no nodes lay above them, the sole exception to this being a few lymph nodes around the thoraco-acromial axis. Radiotherapy was of value as an adjuvant to surgery in all cases and as an alternative to surgery in late cases, but it must not replace surgery to any greater extent than this.

Mr. R. L. Holt (Manchester) discussed the limitations of the methods of treatment now at our disposal. Little reduction of mortality had occurred since Halsted. The Manchester method of purely clinical classification had disadvantages; 40% of Stage I cases were later apportioned by the histologist to Stage II, some 30% of Stage II to Stage I. Comparison of figures from different centres was made difficult by differences in classification.

The results of radical surgery plus post-operative radiotherapy were illustrated by 640 cases. Of these 50% were alive after five years, and 42% free from recurrence. In the performance of the radical operation Mr. Holt advised the use of thin skin-flaps. The results of radiotherapy alone were not so good as those of surgery. In 111 cases treated by pre-operative irradiation subsequent histological examination showed the presence of active cancer cells in the tissue removed at operation. Deep *x*-ray therapy could be regarded as no more than a holding method of treatment.

Recorded results of certain American centres were then discussed. Upwards of 75% of five-year cures might be expected from radical operation and post-operative radiotherapy in Stage I tumours. From the surgical point of view there were disadvantages in pre-operative irradiation, the chief of which were delayed healing, postponement of operation, and a relatively slightly increased difficulty in operative technique because of loss of elasticity in the skin. Radium was more effective than deep *x*-ray therapy in killing cancer cells, but more difficult to manage. In a series treated at Manchester by Keynes's radium method the results in Stage I cases were not so good as those of radical surgery; the method was used now in cases considered unsuitable for radical mastectomy. In Stage III cancer operation must be regarded as the handmaiden of surgery.

The oestrogen and androgen drugs were not in any way curative of cancer; there was no record of a cure from either. Testosterone was preferable in pre-menopausal cases, oestrogens in post-menopausal. Improvement could be expected in only 20%. At the Christie Institute Stage I cases were treated by radical amputation alone. Stage II and Stage III cases were having pre-operative irradiation, and radical amputation as soon as possible thereafter. Stage IV cases were radiotherapeutic problems, surgery being employed only as an ancillary measure.

Lieut.-Col. W. L. Harnett (London), statistical secretary of the British Empire Cancer Campaign, reported a survey he had performed for the B.E.C.C. of 15,200 cases of cancer treated in all London hospitals, voluntary and municipal, over a period of 18 months in 1938–9. Of these, 2,129 were cases of primary cancer of the female breast, and 23 were of primary cancer of the male breast. These had now been followed up for five years. The operation mortality was 3.1%. Only 53 patients (3.9%) were untraced. The growth was confined to the breast with no involvement of lymph nodes in 22.8%; lymph nodes were involved in 21.9%; there was infiltration of skin or muscle (with or without lymph-node involvement) in 35.7%; and distant metastases or enlarged supraclavicular nodes were present in 17.1%. Seven hundred and three patients were treated by radical mastectomy alone; the operative mortality in these was 3.1% and the five-year survival rate 47.6%.

When the cases were subgrouped into stages there was a five-year survival rate of 68.2% in Stage I, 43.6% in Stage II, 59% in Stage III with lymph-node involvement, and 25.6% in Stage III without it. Radical mastectomy was combined with radiotherapy in 393 cases; only 39.9% of these survived five years. Of 133 patients treated by local mastectomy alone, the five-year survival rate was 40.6%—59.6% for Stage I and 19% for Stage III. One hundred and seventy-five patients were treated by radium, with or without surgery, and 63.4% of these survived five years.

Mr. R. Sampson Handley (London) described his attempt to detect early internal mammary lymph-node involvement. Internal mammary biopsy was performed in 31 cases. These lymph nodes were found to be involved in 16 cases, sometimes even from tumours in the outer half of the breast. In a proportion of these positive biopsies the axillary nodes were not invaded, and intercostal biopsy thus served to separate from cases in Stage I a few in which radical operation could not be expected to succeed.

Mr. G. E. Moloney (Oxford) urged the need for earlier diagnosis and affirmed that any woman over the age of 30 who harboured a swelling of the breast for over a month must be regarded as suffering from carcinoma.

Mr. J. R. A. White (Birmingham) made a plea for hormone therapy. He recorded the case of a patient 34 years old who had reported last August with a four-year-old breast cancer adherent to the skin and chest wall, and with multiple skeletal metastases. Bilateral oophorectomy had been performed, and two months later she could walk again, the breast tumour had regressed, and recalcification had been obvious radiologically in the skeleton. The breast had been removed by radical mastectomy and the area treated by *x* rays. Improvement had continued to date, and the affected bones were now, 10 months later, completely reconsolidated and the patient had returned to work, though of course cure could hardly be expected. Other late pre-menopausal patients had been relieved of pain immediately and completely by testosterone.

Professor Ernest Finch (Sheffield) had been distressed always by the pain and disability of late breast cancer; the treatment of cancer of the breast did not cease after operation. He had recently had experience of the complete relief of skeletal and brachial plexus pain by the operation of leucotomy.

Sir Cecil Wakeley, replying, accepted that internal mammary deposits might explain some of the five-year recurrences after the radical operation for Stage I cancer but not for all of them; many must be due to blood-borne metastases.

COMBINED MEETING OF THE SECTIONS OF ANAESTHETICS AND OBSTETRICS AND GYNAECOLOGY

Thursday, July 1

Analgesia in Midwifery

The president of the Anaesthetics Section, Dr. Z. Mennell (London), took the chair and opened the proceedings by defining the scope of the discussion. It was important at the outset to define terms and to differentiate between institutional and domiciliary practice. After a plea that chloroform should not be neglected he called upon Professor W. C. W. Nixon (London) to open the discussion.

Professor Nixon said that the ideal type of analgesic for labour had yet to be found. The method must not endanger the life of the mother or child. Asphyxia neonatorum was still too often due to the analgesic or anaesthetic used. At University College Hospital Dr. Shila Ransom was in sole charge of the analgesia in the department and with a research team was investigating all the new drugs. He strongly recommended that new drugs should be tried first on human volunteers and their effect on the respiration noted before giving them to women in labour. Pethidine took first place among the drugs at present available. After a study of 500 cases it had been found that 150 mg. injected intramuscularly gave relief from pain

without respiratory depression in the baby. Any increase in this dose tended to cause such depression. The use of chloral hydrate, the bromides, barbiturates, and omnopon and scopolamine was reviewed. Anoxia at birth might give rise to an impaired I.Q. later in life. The action of drugs on the uterine contractions must be considered, and there was now an apparatus which would measure the amplitude and frequency of the contractions. Finally, the better the preparation given to expectant mothers for childbirth the less analgesic would be required. Pre-natal explanation and training should be obligatory.

Dr. P. J. Helliwell (London) reviewed the results of the work he had carried out with Dr. Hutton as research fellows of the Association of Anaesthetists of Great Britain and Ireland. He said that very satisfactory analgesia could be produced with nitrous oxide and oxygen and by the portable gas-and-air machine devised by Minnitt. Chloroform could not be administered by midwives, and in this respect trichlorethylene was not without danger. None of the inhalers available for the vaporization of the latter substance could really be depended upon to give a constant strength of vapour. Patients might pass into anaesthesia and must be supervised. A very efficient analgesia using a high percentage of oxygen could be achieved by the inhalation of 5% cyclopropane and oxygen. In America rectal ether took the place of gas and air in this country.

Dr. A. M. Hutton (London) discussed the signs of overdosage with trichlorethylene, mentioning cardiac arrhythmia and tachypnoea. An investigation had been undertaken in sixteen hospitals throughout the country on the efficacy of trichlorethylene and its safety for domiciliary use. This investigation was undertaken under the auspices of the Royal College of Obstetricians and Gynaecologists. A total of 2,354 cases had been reviewed. All had used Freedman's inhaler, and 90% of the patients had had satisfactory analgesia. No increase in the number of cases requiring instrumental assistance had been observed, and it was clear from this survey that trichlorethylene was better than gas and air if the analgesia was started late in labour or without preliminary instruction. Trichlorethylene crossed the placental barrier, but there had not been any increased incidence of asphyxia neonatorum, except when it was used with other analgesics.

A long discussion followed. Dr. G. S. W. Organe (London) pleaded that an anaesthetist should supervise the analgesia in departments of obstetrics. No baby need die from asphyxia neonatorum, since all that was needed was oxygen and artificial respiration. He deprecated the use of undiluted carbon dioxide, which was dangerous and had probably asphyxiated many newborn babies; the mixture with oxygen was extremely valuable. Dr. C. G. Roworth (Swindon) stressed the importance of gaining the complete confidence of the patient. This was not always achieved in the larger clinics. Morphine should not be withheld, especially to ensure rest at night Mr. F. R. R. Martin (Bradford) liked to use chloroform with a Junker inhaler; in his hands this had always proved satisfactory, portable, and convenient.

Mr. J. H. Peel (London) stated that no analgesic gave such complete freedom from pain as caudal anaesthesia. He was pleased to hear that anaesthetists no longer regarded the technique as difficult. In primigravidae its use was contraindicated because of the increased incidence of forceps deliveries, but in multiparae and for obstetrical manipulations and operative procedures it was most useful. He was sorry that this country seemed to be lagging behind America in the use of this method. Dame Louise McIlroy supported Professor Nixon in his demand that only the best anaesthetists should deal with obstetrical cases. She gave 10–15 gr. (0.65–1 g.) chloral each night for a week before labour, as she felt that this helped to relax the cervix. The psychological preparation of the patient was important. The most painful stage was at the end of the first stage and it was then that analgesia must be used. Dr. G. G. Lennon (Oxford) read a short note from Professor Chassar Moir's department describing a new machine designed by Mr. A. Warming, of Copenhagen. This machine had been in use in Denmark for years. It delivered 80% oxygen and 20% nitrous oxide. In the Radcliffe Infirmary it had been used in 60 cases with good results. Dr. G. F. Rawdon Smith (Liverpool) said that women generally should be taught not to terrify intending primiparae with descriptions of their confinements. Dr. H. N. Gregg (Coventry) felt that the obstetric education of the patient should start not with her pregnancy but at puberty.

Dr. H. P. L. Ozorio (Hong Kong) regarded the women of the Western world as spoilt. The Chinese mother was more phlegmatic and made a good patient. It was important to consider the psychological make-up of patients when discussing analgesia. A mother who heard her baby cry seldom had post-partum haemorrhage. Dr. Edith Gilchrist (London) noted a discrepancy in the findings with hysterography as between Nixon and Bourne. Unlike Professor Nixon, the latter found that nitrous oxide actually increased the uterine contractions.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Friday, July 2

Third Stage of Labour and its Complications

With Professor Hilda N. Lloyd (Birmingham) in the chair, Dr. J. D. S. Flew (London) opened the meeting by saying that it was his desire to be provocative in his remarks and to put forward the following questions: (1) Should the obstetrician's or midwife's hand be placed on the fundus of the uterus during the third stage of labour, and, if so, how should it be placed? (2) In third-stage haemorrhage should the use of ergometrine be advised, especially for midwives? (3) Was bimanual compression of the uterus possible per abdomen? (4) How long should the third stage of labour be allowed to continue in the absence of haemorrhage?

Dr. Flew reviewed the physiology of the normal third stage and said that it appeared that the primary factor causing placental separation was at a maximum at the moment of expulsion of the baby's body, and that the time which lapsed before we considered the placenta ready for expulsion was concerned with the action of the secondary powers and the separation of the membranes from the uterine wall. A badly conducted third stage could cause post-partum haemorrhage, the bad conduct consisting usually in feeble attempts to express the placenta by massage and the pushing of the uterus downwards. This downward pressure of the uterus was considered to be dangerous, possibly by its action of causing uterine engorgement. If the uterus was to be touched at all it should be held with a wide grip suprapubically and, if anything, pushed upwards rather than downwards. It was suggested that the midwife should not be discouraged from using ergometrine, as the danger of a constriction ring was more apparent than real. Midwives in all districts should be allowed to carry ergometrine in their bags.

Bimanual compression of the uterus after removal of the placenta was possible with both hands on the abdomen; a broad suprapubic grip on the uterus was maintained while the other hand was placed on the posterior wall of the uterus per abdomen. Unless the patient was grossly fat it was surprising how efficiently the placental sinuses could be compressed by this method. In the absence of bleeding, and if the third stage of labour had been well conducted, the placenta should be removed within one hour of the baby's birth. Properly conducted bimanual removal of the placenta was not a dangerous operation. Dr. Flew warned against holding the baby high above the level of the mother before clamping the cord, since by doing that it was possible to transfuse the placenta with baby's blood.

Professor H. L. Sheehan (Liverpool) pointed out that his remarks dealt with the failures in treatment and not the successes. The cases he mentioned were those dying following retained placenta, or as a result of post-partum haemorrhage in the fourth stage, apart from cases of ruptured uterus, serious lacerations, etc. Two-thirds of these patients died from haemorrhage and shock in the first 12 hours after delivery, and the other one-third recovered temporarily but died later in the puerperium.

There were four main groups of cases of retained placenta: (1) Placenta separated completely but held *in utero* by a constricting ring—not usually a sufficiently serious condition to be a cause of death. (2) Placenta not separated though normally attached to uterus. One part, the lower, was usually separated and had caused considerable haemorrhage. There was no anatomical reason for the retention, since the remainder of the

placenta easily separated. The cause appeared to be poor retraction of the uterus. (3) Placenta morbidly adherent at one or two places, due to structural abnormality of the attachment. Usually in this type of case a piece of placenta was retained *in utero*. (4) Placenta morbidly adherent all over—placenta accreta.

There were three factors to be considered in cases of death (usually within eight hours of the birth of the baby) due to retention of the placenta—namely, blood loss, traumatic shock due to the manner of removing the placenta, and the length of the third stage of labour. Blood transfusion was of no value in cases of shock without loss of blood. Obstetric units where active interference in the third stage was the treatment enforced had been compared by Professor Sheehan with units where no interference was countenanced, and the results showed little or no difference. Most of the deaths were of patients left for three to seven hours with the placenta *in utero*.

Dr. P. L. Mollison (London) discussed the rhesus factor, the importance of transfusing women with Rh-negative blood and of treating immediately haemolytic disease of the newborn. It had been shown that infants born to women who had been sensitized as a result of blood transfusions were more severely affected than the average and in fact had a mortality rate of approximately 50%. When an Rh-negative woman in whose serum anti-Rh had been found went into labour it was important that facilities for treating the baby were prepared. Since a proportion of these infants were in a critical condition at the moment of birth it was a wise precaution to have ready an oxygen tent in which the infant could be placed immediately after birth.

Opening the general discussion Mr. F. R. Stansfield (Ipswich) made a plea for the planned use of the abundant knowledge we already possessed. He had investigated ten deaths due to post-partum haemorrhage, and had found that in each and every case the fatal outcome was due primarily to delay. He outlined a set plan of campaign for treating such cases. Dame Louise McIlroy (London) was of the opinion that slow extraction of the baby's head (up to 20 minutes) and slow extraction of the placenta when separated were important steps in the conduct of labour. She advocated a suprapubic pad with a many-tailed binder in the treatment and prevention of post-partum haemorrhage. Mr. G. G. Lennon (Oxford) illustrated important steps and dangers to be avoided in manual removal of the placenta. He stressed the necessity for getting to the fundus of the uterus as a first step in order to diagnose cornual constricting ring, and to begin separation from above downwards so that the uterus might retract down on the sinuses opened up. Other speakers advocated early manual removal of the placenta while the woman's condition was good.

Dr. Flew, in summing up, said that there had been a great measure of agreement on the necessity for using oxytocic drugs and early manual removal of the placenta in the treatment of post-partum haemorrhage.

SECTION OF DISEASES OF THE CHEST

Thursday, July 1

Upper Respiratory Disease and Certain Lung Conditions

With the president, Dr. R. R. Trail (London), in the chair, Dr. W. Paton Philip (Cambridge) opened the discussion by stressing the essential unity of the upper and lower respiratory tracts in relation to diagnosis and treatment of respiratory diseases. Certain broncho-pulmonary conditions were described which coexisted with or might be ascribed as due to infections of the upper respiratory tract, including especially the paranasal sinuses. The pulmonary conditions were often transient, but were frequently recurrent unless efficient and often prolonged treatment was directed to the paranasal sinus infections. Co-existing pulmonary conditions were largely or most frequently due to lobar collapse or atelectasis, lobular collapse, broncho-pulmonary segmental collapse, or partial deflation by bronchial emboli. Examining doubtful radiological shadows in the lung they should remember that the aphorism of Twining, "Think atelectasis," was sound doctrine. Radiological investigation should include the lateral and lordotic views.

The site of election was in the lower lobes and right mid-lobe, as opposed to the upper lobes. Pulmonary abscess with "pneumonitis" in this series was conspicuous by its abscence. Tuberculin testing in the case of children in the series had given consistently negative results. His study was based on personal experience extending over 25 years, and included 372 cases annually occurring among an annual average attendance of 2,375 new cases referred to an out-patient chest clinic for opinion by general practitioners, school medical officers, and E.N.T. surgeons. Sinus infection, with resulting atelectasis, if not relieved may prove to be the forerunner of frank bronchiectasis.

Dr. R. R. Trail emphasized that lung abscess was not found associated with paranasal sinus infection. Dr. F. H. Young said that he found lipiodol in a paranasal sinus immediately after a bronchogram had been made. There was evidence to suggest that, as the paranasal infection might cause the lung infection, so an established lung infection might cause or prolong a paranasal infection. In reply to a question by Dr. Young, Dr. Paton Philip said that in routine examinations it was sufficient to *x* ray the frontal sinuses and antra.

Opening a discussion on "The Present-day Treatment of Pneumonia," with Dr. F. H. Young (London) in the chair, Dr. Lindsey W. Batten (London) asked whether, treatment apart, lobar pneumonia was the disease it had been 30 years ago? Had it, before chemotherapy, already become, like some other acute infectious fevers, a disease of waning intensity?

Before the day of chemotherapy the problem had been not to cure a self-limited disease but to sustain the patient's resistance until he had recovered. The length of the course had been all-important, exhaustion the danger most feared. Rest, nourishment, and economy of exertion had been first objectives, and expert nursing in hospital the obvious means to their attainment. Chemotherapy, by greatly shortening the course of fever and toxaemia, had largely eliminated the danger of exhaustion in those not handicapped by age or serious incidental disability. Home, not hospital, might be the place of choice, and the management of pneumonia at home thus assumed a new importance.

Many details of management were still open to discussion—e.g., temperature of room and relative importance of ventilation and warmth; the allocation of priority among sleep, food, and drugs; hot, tepid, or cold water for sponging; the patient's position in bed; the drugs for relief of pain and cough, for sleep, and as aperients; the usefulness or futility of poultices; the place of oxygen and of cardiac or respiratory stimulants in treatment. Chemotherapy was not standardized. No close agreement appeared between recent authorities on the choice or dosage of sulphonamides; the precise place of penicillin in treatment and even the method of administration had probably still to be determined. Finally, the considerable minority of pneumonias, benign or virulent, untouched by chemotherapy must not be forgotten.

Dr. F. H. Young produced evidence, based on the number of cases referred to a consultant, which suggested that pneumonia had begun to decrease in clinical severity before the use of sulphonamides. It appeared that one did not see now the classical type of lobar pneumonia.

Dr. R. R. Trail said that any statistics of pneumonia in general practice must depend on two main factors: the prevalent infections in the doctor's area and the criteria he set up for treatment at home as against treatment in hospital. There was a definitely improved prognosis of all forms of pneumonia since the introduction of the sulphonamides; moreover, these agents were now given in most cases in the earliest possible stages, and it might well be that many of the so-called non-bacterial types were arrested developments of what would have proceeded to a full-blown pneumonia. There was also nowadays an increasing use of *x*-ray diagnosis. A third factor to be considered was that during the war all chest conditions in young people had a much greater chance of early admission to service hospitals. Published results on the proportion of bacterial to non-bacterial pneumonia did not help with regard to the general population. American estimates varied from 15 to 75%. Possibly the age of incidence was higher and symptoms and signs were changing somewhat—e.g., rusty sputum was said to be much less common than it had been some 10 years ago

Dr. G. S. Haynes (Cambridge) agreed that orange juice, glucose, and fluids were sufficient food for cases of pneumonia. Dr. R. G. Anderson (Cheltenham) said that his impression was that, whereas empyema had been as frequent or perhaps more frequent when sulphonamides had first been used, it was now becoming rare. Could this be the result of penicillin treatment?

Dr. Lindsey Batten, in summing up, said that the main difference from former times was that the present type of pneumonia did not become full-blown. Some people were more liable to repeated attacks of pneumonia than others—e.g., those with sinus infections, and others who might have low resistance in the lower air passages. The present type of disease did not progress to rusty sputum production. When he used the term pneumonitis he referred to a presumed pathological state of a portion of lung. By pneumonia he referred to a general state of illness of a patient.

SECTION OF ORTHOPAEDICS

Thursday, July 1

Operative Treatment of Recent Fractures

With the president, Professor T. P. McMurray (Liverpool), in the chair, Mr. Bryan McFarland (Liverpool) opened a discussion on the operative treatment of recent fractures, which he divided into three categories. First, those in which operation was *essential*; secondly, those in which it was *permissible*; and thirdly, those in which it was, to say the least, *inadvisable*. As a result of treatment the patient should be at least no worse off than if he had been left alone, and to justify open operation there must be a reasonable probability that the result would be better than if a closed method had been used. The added risk of interference must be balanced against the probable benefit either in time or in degree of relief. The separation of the three groups might vary with the skill and experience of the surgeon, but no cases should be put into the last group because of fear of the possible results in inexperienced hands. No such hands should be permitted the opportunity of prejudicing what was otherwise perfectly good practice.

Mr. McFarland gave the following examples of fractures in which open operation was essential. In fracture of the lateral condyle of the tibia with separation of a large fragment which was irreducible because of interposed material operation was essential in order to restore shape, movement, and stability. Fragments from a comminuted patella must be excised and the extensor mechanism repaired; a similar repair was required in transverse fractures whatever method was used to deal with the bone. Operation was also essential in fracture-dislocation of the humeral head; fracture with rotatory displacement of the lateral humeral condyle; incarceration of a medial epicondyle within the elbow joint (but without transposition of the ulnar nerve); fracture of the olecranon, in which small fragments were excised and the larger ones fixed by a screw; and fracture of the radial head with comminution. Operation was *permissible* for fracture-dislocation of the tarsal scaphoid; grossly comminuted fracture of the os calcis, when excision of the fragments relieved the tension and partial ischaemia of the foot; unstable oblique fractures of the tibial shaft; irreducible supracondylar fracture of the femur; intertrochanteric fractures in which external fixation might be impracticable on account of the age and condition of the patient; transcervical femoral fractures; Monteggia's ulnar fracture with dislocation of the radial head; single oblique fracture of the lower third of the radius; and occasionally for fractures of both bones of the forearm. Operation should *not* be performed for comminuted fractures of the os calcis without gross displacement; Pott's fracture-dislocation; simple fracture of the tibial shaft; comminuted fracture of the tibial condyle; or for fracture of the shaft of the femur. In the latter the anatomical perfection of end-to-end alignment did not justify the risks of delayed union which plating might produce. Fracture of the carpal scaphoid did not require operation; the results had been very disappointing. It was obvious that many other common fractures such as Colles's fracture should not be operated upon. He felt that the great advantage of open operation was when one fragment was so small or so shaped that it could not be replaced or retained and it was clear that persistent displacement or non-union would prejudice function to a serious extent.

Mr. James Patrick (Glasgow) said that the radiographic appearances were of no importance if the clinical result was perfect, therefore he agreed that the simplest method with least risk to the patient should be adopted in almost all cases. Where open operation was necessary the introduction of ordinary steel was bad because it corroded and led to devitalization of the adjacent bone and possible later spontaneous fracture. The use of two dissimilar metals accelerated the disintegration. The metals most suitable were stainless steel or vitallium. Mid-shaft fracture of the radius alone, often considered a simple problem, was an example of the need for particular care because of the possibility of late displacement and consequent derangement of the inferior radio-ulnar joint. If this occurred early open fixation was required. In fracture-dislocation of the upper end of the humerus he believed that open operation would be needed less often if traction was applied to the arm in 90° abduction and 40° forward flexion with the patient half supine. An incarcerated medial epicondyle could be extracted from the elbow joint without open operation by the application of faradism to the flexor muscles while the patient was anaesthetized.

Mr. A. L. Eyre-Brook (Bristol) said the indications for operation ranged from those which were essential, as in open fractures, through less essential grades, such as fractures requiring internal fixation to obtain union; small fragments in fractures involving joints; and cases showing failure to maintain adequate reduction of two major bones in one limb. In the final group operation was *elective*, as, for example, when it was employed to reduce the period of immobilization. Dangers still existed in spite of penicillin. Good judgment was needed, and the good surgeon would plan his treatment not only upon his own ability but also upon the circumstances in which he was working.

Col. H. R. Sheppard, R.A.M.C., said that because operation delayed union more prolonged immobilization was required with splints afterwards than when closed methods were used. Mr. W. R. D. Mitchell (Rugby) said that operations, if necessary, should be done within the first two or three days. Both Mr. B. Whitchurch Howell (London) and Mr. Norman Capener (Exeter) stressed the value of operative fixation of fractures in the region of the femoral trochanters as giving an easier convalescence for the elderly patient. Mr. A. D. Le Vay (London), describing a recent visit to Professor Küntscher's clinic, stated that 5% of the nailed cases became infected, and this and the large amount of *x*-ray screening necessary were major drawbacks from a British point of view. Mr. R. W. Butler (Cambridge) made a special plea for operative treatment in old people; it could at times give them freedom from irksome fixation. Mr. James Russell (Glasgow) considered that Mr. McFarland had presented a well-balanced statement of the operative treatment of fractures in general, and he felt that the aim must always be to attain the maximum of function with the minimum of risk.

Mr. McFarland, in reply, said that, while operation would still be necessary where function would otherwise be impaired, he wished to say as emphatically as possible that wholesale operations on closed fractures were to be utterly and completely condemned.

Treatment of Acute Haematogenous Osteomyelitis

Dr. J. Trueta (Oxford) said that acute haematogenous osteomyelitis was caused by pyogenic bacteria, most commonly the *Staphylococcus aureus*. The organism usually reached the bone in the blood of the nutrient artery. Thrombosis was an early phenomenon of the infection, and the extent of damage to the bone depended on the area deprived of its blood supply. This area was determined by the position in the vessel of the original focus, by the spread of the thrombosis, and later by the spread of the pus into the subperiosteal space, where, by the stripping off of the periosteal vessels, the cortex was also deprived of its remaining blood supply. Modern treatment aimed at the preservation of as good a blood supply to the bone as possible and achieved it by the combination of early intensive and sufficiently prolonged penicillin treatment, early relief of the intra-osseous and subperiosteal pressures by limited conservative surgery, and correct immobilization of the affected

part. Success depended on the prompt use of these three therapeutic elements, and the main prerequisite for effective treatment was early diagnosis. It was necessary that every clinician and general practitioner should be aware of this urgency, since in the last resort success or failure of the treatment was determined by the time elapsing between the first symptom and the patient's arrival in the surgical ward of the hospital. Multiple drill holes were made throughout the extent of the lesion into the medullary cavity. Penicillin was given generally by intramuscular drip to the extent of 400,000 units in twenty-four hours for the first three days, 300,000 units on the fourth day, and 200,000 units on the fifth day and onwards, these amounts being varied according to the weight of the child. It was important to have the full resources of a pathological laboratory for the isolation of the organism and for testing its sensitivity.

In the subsequent discussion several speakers referred to the supposed difference in incidence as between rural and industrial populations. Dr. Trueta, in reply, said that it was essentially a matter of "soap and water." Where standards of cleanliness were high the incidence of osteomyelitis was low.

SECTION OF PATHOLOGY

Thursday, July 1

Acute and Subacute Hepatitis

With Professor Dorothy Russell (London) in the chair, Professor H. P. Himsworth (London) opened the discussion and said that the clinical picture of acute, subacute, and chronic hepatitis (cirrhosis) did not entirely correspond to the pathological findings. The clinical features of acute hepatitis resulting from acute or subacute necrosis were well recognized. Subacute hepatitis was characterized by anorexia, enlarged liver and spleen, oedema of the ankles, and spider telangiectasis. Jaundice might be absent throughout the illness. In the plasma there was a low albumin and raised globulin content. These patients went on to develop a chronic hepatitis, and cirrhosis was seen at necropsy. Subacute hepatitis could be produced experimentally with typical lesions in the liver, leading to irregular scarring, among cases of normal parenchyma. Although the causation of many cases was obscure the level of nutrition might determine whether an acute case would recover or go on to the subacute stage.

Professor J. H. Dible (London) described the histological changes revealed by liver biopsy. The changes were essentially the same whether the hepatitis resulted from arsenotherapy (54 cases with 2 deaths), "serum jaundice" (15 cases with 2 deaths), or acute idiopathic (catarrhal) jaundice (23 cases with no deaths). There was a disappearance of cells around the central vein, with swelling and degeneration of surviving cells; there were normal cells at the periphery of the lobule and some infiltration of the portal tracts with lymphocytes, plasma cells, and polymorphs. The reticular pattern was well preserved, and this might play some part in regeneration. Although the lobule shrank there was an apparent increase in the supporting framework due to condensation. Bile could be demonstrated in the necrotic liver cells and endothelial cells and as bile thrombi in the bile canaliculi. The essential lesions therefore were destruction and necrosis which followed the passage of bile into the blood stream and an obstruction by bile thrombi. There was a remarkable absence of fat, but glycogen was well preserved. The usual result was complete cure, though death might occur in severe cases, or the process might resolve, leaving a liver scarred by fibrosis. In moderately severe cases young fibrous tissue might form between the bile tract and the central vein, leaving rounded islets of liver tissue with surviving cells.

Dr. G. W. M. Findlay (London) spoke of the effect of malnutrition in the causation of hepatitis, first described in 1500 when Columbus's sailors returned with jaundice as a result of their appalling diet. Hepatitis was common in the Tropics, particularly when a poor diet was accompanied by malarial infection. Dr. Findlay gave statistics showing the higher mortality from hepatitis among natives in West Africa as compared with Europeans, and suggested that this was due to the low protein diet of the natives and the high incidence of malaria. He hoped that records of all cases of hepatitis treated with casein hydrolysate would be collected, as he had seen 5 patients in coma who had recovered dramatically after intravenous casein.

Dr. J. A. R. Miles (Cambridge) drew attention to the association between bacterial infection and hepatic necrosis and cirrhosis, and particularly to the adjuvant action of bacteria on the toxic effects of chloroform and phosphorus. He had produced acute necrosis of the liver in rats on low protein diets, insufficient in themselves to cause necrosis, when chance infection with *Salm. typhi-murium* had occurred. Experimental lesions in rats had been produced with infective hepatitis material but had failed after 13 passages. Other material, including some from icterogenic serum, had failed to produce lesions.

Dr. J. N. P. Davies (Uganda) recalled the fibro-fatty liver disease seen in Africans which led to pseudo-monolobular cirrhosis. Infective hepatitis and acute necrosis also occurred but led to an intermediate type of lesion similar to that described by Professor Himsworth. He thought that infections and abrupt malnutritional episodes in Africans might cause these lesions when superimposed on the fibro-fatty liver changes already present. He also suggested that the "oestrinization" which commonly appeared in male Africans (gynaecomastia and feminization of the skeleton) might play a part in the high incidence of primary hepatic carcinoma in Africans, and thought that the role of the endocrines in liver disease should be studied.

Dr. J. Gillman (South Africa) said that the genesis of cirrhosis was different in South African natives from that in India and the U.S.A. He made a plea for a world survey of cirrhosis in different groups in different states of nutrition.

Prophylaxis of Virus Infections

With Dr. R. J. N. Greaves (Cambridge) in the chair, Dr. C. H. Andrewes (London) opened the discussion and said that vaccines made from viruses inactivated by formalin or ultraviolet light might give useful and safe protection—for example, in influenza—but this protection was not of long duration. Attenuated living viruses gave protection for a longer period, and the 17D strain yellow-fever vaccine was an ideal vaccine with a trivial general reaction and long immunity. Many viruses grown on eggs altered enough to allow of suitable prophylaxis without reaction—e.g., influenza, mumps, and measles. The existence of numbers of serological strains, however, complicated the task. In influenza strains A and B were unrelated antigenetically and epidemiologically, A being responsible for epidemics every two to three years and B every four to six years. Some success with influenza vaccines was achieved in 1943 and 1946, but they were a complete failure in the 1947 epidemic. To study variations and to collect strains from all sources the World Influenza Centre had been set up at Hampstead. He described the experimental production of immunity by the interference phenomenon. Ferrets infected with an influenza B strain which had little effect on them were later infected with known virulent influenza A with no ill effect. Later contact exposure was also without effect. This might be a pointer to artificial virus immunity, as the phenomenon also occurred with serologically unrelated viruses. He described the recent developments in the field of prophylaxis against mumps, measles, rubella, rabies, and the common cold. The work on the common cold at the Salisbury centre had not yet reached a conclusion. He described attempts at prophylaxis of the common cold with bacterial vaccines as flogging a dead horse, and thought that the volume of controlled scientific evidence available was enough to have killed the horse.

Professor R. Hare (London) agreed that it was still impossible to protect humans against many of the commoner virus infections. The study was difficult because of the lack of susceptible animals and of the technical difficulties in the preparation of large quantities of virus vaccines even from eggs—themselves in short supply. Inactivated viruses on the whole were less satisfactory than attenuated vaccines. Even if they appeared to protect animals they often fail to protect humans, especially under field conditions.

Professor W. I. B. Beveridge (Cambridge) was more optimistic in his suggestion that, while immunization was judged by its poor results in the individual, herd immunity might be greatly

increased by large-scale immunization even though there were failures in individuals. Individual immunity depended on contact between the virus and circulating antibody. If the route of infection was by the blood stream as in yellow fever and the exanthemata a basic immunity sufficed, as antibody production was greatly increased during a long incubation period. Invasion without contact with the blood stream occurred in influenza as the virus was spread over the lung mucosa. Many adults had circulating antibody but no immunity to influenza. He thought that greater attention should be paid to the part played by allergy, which could concentrate antibody at the site of infection. A further field of investigation was the removal of cell receptors for viruses by chemical methods.

Dr. M. G. P. Stoker (Cambridge) recalled that during the war there were many instances of severe smallpox in vaccinated patients. Some were due to long intervals since vaccination and others had been vaccinated only after exposure. Many vaccinations failed because the "immediate reaction" was accepted as a criterion of immunity, whereas it was an indication of sensitivity to vaccinia not necessarily associated with immunity. In spite of theoretical objections Nagler's technique for estimating vaccinial antibodies by inhibition of haemagglutination might help in assessing protection. Vesiculation was necessary for an increase in immunity, and primary or accelerated reactions should alone be regarded as successful "takes." Egg virus was satisfactory, and the ratio between active and inactive virus might be important because of the interference set up by inactive virus particles. Most centres agreed that the minimum of active virus laid down by the League of Nations was too small.

Dr. G. W. M. Findlay (London) said that in the war 50,000 Europeans and 250,000 Africans had been immunized with yellow-fever virus and the war could not have been won without this great achievement. There were only 3 cases of yellow fever among these Europeans in spite of civilian outbreaks of normal proportions. The French had now immunized between 4 and 5 million people in their colonies, but our programme had now ceased. Jenner had first described the phenomenon of "interference" between two viruses, herpes and vaccinia, as long ago as 1804.

Dr. C. H. Lack (London) asked whether immunity to smallpox was related to the survival of virus at the site of inoculation. He had recovered virus locally after three months, and a Japanese worker recently reported recovery 10 months after vaccination. He also thought that the effects of certain viruses might depend on the presence of hyaluronidase-producing cocci which could disseminate the virus over a wider area of susceptible cells.

Strangeways Research Laboratory

Dr. A. F. W. Hughes delighted the visitors from the Section of Pathology with a beautiful demonstration of mitosis in tissue culture material under phase-contrast illumination. A film shown by him indicated the differences in mitosis in such species as the newt and the xenopus as compared with young fibroblasts. Prophase, metaphase, and anaphase were clearly seen as well as the hyperkinetic activity of the nuclear and protoplasmic bodies. Miss M. H. Hardy produced well-formed hair follicles from embryonic mouse skin and showed the several stages in the process.

Dr. I. Lasnitzki compared the action of irradiation on malignant tissue growing *in vitro* and *in vivo* and pointed out the considerable difference due to the secondary effects *in vivo*. Two-thirds of the damage done by irradiation is the delayed vascular effect and only one-third is due to the immediate effect on the cells. Dr. A. Glausmann and Dr. F. G. Spears demonstrated their method of histological assessment of the radiation treatment of cancer. They base their prognosis on a chart showing the relative numbers of mitotic cells and resting cells as compared with the differentiated cells and the degenerating cells. In a series of 1,000 cases of carcinoma mainly of the cervix and buccal cavity their histological assessment given one or two weeks after radiation had been correct in 90%.

Electron micrograph studies of growing avian tubercle bacilli were shown by Drs. E. M. Brieger and V. E. Cosslett. The growth consisted of short dark rods which later became elongated. Between these two stages vacuoles appeared in the bacilli.

SECTION OF PHYSIOLOGY, INCLUDING BIOCHEMISTRY

Thursday, July 1

Physiological Basis of Neuromuscular Disorders

With the president, Professor A. C. Chibnall (Cambridge), in the chair, a discussion was held on the interpretation of neuromuscular disorders, and in particular the bearing of such interpretation upon the evidence for chemical transmission of the excitatory process from nerve endings. Sir Henry Dale, in opening, said that the theory of chemical transmission at peripheral autonomic endings might presumably be taken as accepted. This had not had much effect on clinical medicine, except on the interpretation of the actions of atropine, physostigmine, and the like. Loewi's observation of the abnormal sensitiveness of the pupil to adrenaline in Graves's disease was recalled and the question raised whether such conceptions as "vagotonic" and "sympathicotonic" could be given a clearer experimental basis. The possibility of "histaminergic" vasodilators was mentioned, but the consideration of their clinical significance belonged rather to the discussion on antihistamine drugs. Of more importance for neuromuscular disorders was the evidence suggesting chemical transmission, by sudden liberation and sudden removal of acetylcholine, at ganglionic and at nerve-end-plate synapses. This theory had allowed a much clearer conception to be formed of the modes of action at these junctions of curarine on the one hand and of physostigmine and its analogues on the other. It made it possible to differentiate the action of botulinus toxin, paralysing the actual nerve endings or their mechanism for releasing acetylcholine, from that of curarine, which left the nerve endings and the release of acetylcholine from them unaffected but made the motor end-plate insensitive to its stimulus.

The action of tetanus toxin in producing local tetanus could similarly be located at the nerve endings, which appeared to lose the power of holding, but not of synthesizing, acetylcholine, and also lost part of their normal cholinesterase. Recent studies of myasthenia gravis and of the alleviating effect upon it of anti-cholinesterases afforded the most obvious example of the value of the chemical transmission theory for the understanding of neuromuscular disorders. Sir Henry Dale also mentioned congenital myotonia and recurrent familial paralysis, though recent observations seemed to show in both cases that the abnormality of function was in the muscles. To what extent could the mode of transmission at peripheral synapses be carried by analogy to the central nervous system?

Professor F. R. Miller (University of Western Ontario) showed a number of graphs illustrating the action of acetylcholine on the hypoglossal nucleus and the respiratory centre. He began by summarizing earlier work on the effect of eserine and acetylcholine on the cerebral cortex and masseter muscle of the rabbit. An attempt was then made to determine whether acetylcholine would act locally on a motor nucleus, and for this purpose the hypoglossal nucleus was selected. Eserine and acetylcholine were shown to enhance transmission at the connecting synapses. Changes in respiration and convulsive disorders were recorded. It appeared that acetylcholine must act directly on the inspiratory centre. The results were similar to those obtained by the injection of small amounts of acetylcholine into the cord circulation. There appeared to be evidence that the mode of transmission at the peripheral synapses might be extended to the central nervous system.

Dr. W. S. Feldberg (Cambridge) said that cholinergic nerves contained definite but limited amounts of acetylcholine bound to some tissue constituents. Any acetylcholine released by the nerve impulse was at once replaced by synthesis. The nervous tissue, however, was unable to build up a store of acetylcholine greater than its normal physiological complement. Synthesis therefore was closely linked with and dependent upon the release. The mechanism of the synthesis at the motor endings could be studied in any part of the nerve fibre. He described the synthesis under conditions in which the enzyme remained attached to the tissue and with other methods by which it was brought into solution. The results indicated that some at least of the motor and sensory pathways consisted of chains of neurons which were alternately cholinergic and non-cholinergic in character.

Dr. Bernard Katz (University College, London) gave a brief survey of the chain of events by which a message was relayed within a motor unit, and discussed the essential differences between unicellular and synaptic transmission of the excitation wave. Three principal links in the neuromuscular transmission chain which could be weakened or broken experimentally were: (1) liberation of transmitter; (2) its reaction with the muscle receptors; and (3) initiation of the muscle impulse. Discussing the effect of curarine, he said that curarine blocked nerve-muscle transmission but the block was perfectly reversible. In a weak curarine block a single nerve impulse arriving at the nerve-muscle junction produced no effect, but two or more were able to restore the junction.

Dr. Andrew Wilson (University College) gave a short account of attempts to influence neuromuscular conduction in patients with myasthenia gravis by inhibiting the cholinesterase activity of the blood with di*iso*propyl fluorophosphonate (D.F.P.) and with "prostigmin." Small doses of D.F.P. had been given to 9 cases of myasthenia gravis. In 4 cases treatment was abandoned, owing to the patients' tendency to have nightmares and vivid dreams, but in the other 5 the favourable effect on the signs and symptoms of myasthenia gravis was maintained for from 16 to 24 months. The clinical effects produced by the intra-arterial and intramuscular injection of D.F.P. were compared with those produced by the similar administration of prostigmin.

Dr. C. A. Keele (Middlesex Hospital) discussed the pharmacological action of the condensed alkyl phosphates hexaethyltetraphosphate (H.E.T.P.) and tetraethylpyrophosphate (T.E.P.P.), which was very similar to that of eserine and prostigmin. These compounds were powerful anticholinesterases. T.E.P.P. was about four times as potent as H.E.T.P., and both substances had actions which lasted much longer than those of eserine and prostigmin, but not so long as that of di*iso*propyl fluorophosphonate. T.E.P.P. was effective in the treatment of myasthenia gravis when given by intramuscular injections or by mouth. With single injections it was half as potent as prostigmin; its peak effect occurred in about one hour as compared with twenty to thirty minutes for prostigmin, and after a single injection the effects of T.E.P.P. lasted about twice as long. With repeated injections its effect was markedly cumulative. By mouth it was much more effective than prostigmin. The visceral and side effects of the two compounds were similar.

Dr. G. L. Brown (London) was prevented owing to the lateness of the hour from presenting his paper describing recent work on myotonia.

SECTION OF PREVENTIVE MEDICINE

Thursday, July 1

Acute Poliomyelitis

With Dr. F. Hall, vice-president, in the chair, Dr. William Gunn (London) delivered the opening occasional paper on "Acute Poliomyelitis: Epidemiology and Control," illustrating it by slides and charts. He said that against a background of steadily receding importance in medicine epidemic diseases included at least one which, like the menace of war, remained a persistent cloud on the human horizon. By no means a new disease, acute poliomyelitis had in recent decades acquired special malignant characters that were expressed in periodic explosive prevalence and high clinical severity. Comparison with influenza and possible association of the two with two world wars was inevitable. Differences were more striking than resemblances. In both the causative agent had been isolated, but effective immunization techniques had not ensued. During epidemics both tended to be particularly lethal, with selective preference for young adults. Attacks appeared irrespective of previous health, social class, or environment.

Differences between the diseases included immunity from subsequent attack after poliomyelitis, patchy and circumscribed localization of outbreaks, frequent contamination of water supplies, and high ratio of latent or abortive to clinical attacks in comparison with influenza. Nor had the relation to war been uniform. Influenza followed the first world war but unexpectedly failed to materialize after the second.

Vaccines had proved either ineffective or dangerous in cases of poliomyelitis. Passive immunization with immune-serum was applicable only in special circumstances. The greatest success in limiting the spread of infection was based on an assumption that transmission was by droplet nuclei from the upper respiratory mucosa—hence restriction of travel, avoidance of places of close assembly, and segregation of suspects and contacts. The influence of temperature and humidity in evoking or accelerating epidemicity had not been fully investigated. It was of interest that the largest epidemic in our history had coincided with one of the hottest summers on record.

Dr. F. W. Bunting (St. Helens) outlined the investigation made into an epidemic occurring in a country area. He emphasized that here was an infectious disease where a few reasonable precautions could be taken by members of the public on their own initiative. Where more rigid isolation of the actual case was required, and during epidemics, a firm line should be taken by the authorities to prevent children attending cinemas. A trained team of investigators should be kept in readiness for the onset of a possible epidemic, to work in conjunction with the local medical officer of health and his staff.

Dr. J. C. R. Buchanan (Fiji) said that although poliomyelitis was seldom recorded in epidemic form in tropical countries it was not safe to assume that a hot climate *per se* was protective. Recent epidemics in the Solomons reached a known case incidence of upwards of 2 in 1,000. There was more likely to be a latent endemicity, but we still did not know enough to show what the precipitating factor actually was.

Dr. E. D. Irvine (Dewsbury) said that during epidemic periods dental gas anaesthesia should be better controlled. The use of rebreathing apparatus by numerous persons was a probable risk. Dr. J. Alison Glover (Berkhamsted) emphasized the impossibility of attempting to isolate carriers. The suspension of tonsillectomy and the effective chlorination of swimming-bath water were obvious measures. Dr. Josefine W. Webb (Eton) said that registration of carriers, if based on contact and the occurrence of pyrexia, was impracticable.

Dr. H. S. Banks (London) said that notifications of poliomyelitis in recent years had included a large number of non-paralytic cases, and that factor should be allowed for in comparing recent with former notifications. The *abortive* case could not be diagnosed with any degree of accuracy in this country, at least by an agglutination test. It was also too optimistic to say that the cell-protein dissociation factor in the spinal fluid "clinched the diagnosis" in the *non-paralytic* case, since there were many exceptions. Did the epidemiological facts warrant the assumption that the virus in the pharynx was more highly infective than that in the faeces? Field studies might be directed to that point with a view to determining the limits of the usual infective period of the disease. Was the fact that virus might persist in the stools as long as 10 weeks of little importance in infectivity? There was no real evidence that serum or gamma globulin had any place in prophylaxis.

He deprecated the issue of the many instructions from public health departments in 1947 for the control of the disease that were unjustified by existing knowledge. When poliomyelitis was epidemic nothing was gained by attempts at sterilization of faeces in the home. Prohibiting public meetings even of children was unwarranted without more exact knowledge of its efficacy. Little could be done in the administrative control of the disease except to avoid tonsillectomy (but not necessarily other throat, nose, or dental operations) and to encourage general hygiene, especially the washing of hands.

Morbidity Statistics

In a paper on "Ascertainment and Use of Morbidity Statistics" Dr. P. L. McKinlay (Scottish Health Department) spoke of a growing dissatisfaction with the inadequacy of our basic health information. Available sources of routine statistics fell far short of the desirable in failing to cover important sections of the population, in omitting minor ailments, and by appreciable inaccuracies, especially of certified cause of illness. In addition to machinery for the provision of routine data there should be facilities for carrying out special morbidity inquiries to elucidate points emerging from analysis of routine information. Hospital data, because of their selective nature, gave a distorted picture of frequency, type, and severity of illness. Recording in hospitals should be directed principally to the

solution of special problems associated with particular diseases and assessment of therapeutic measures.

Dr. J. Maddison (Twickenham) spoke of the many factors which might have to be considered in trying to arrive at the cause of illness. That made it difficult for any medical man working single-handed to institute special inquiries or to carry out the research himself. It was desirable for clinicians to understand more about statistics so that they could give effective co-operation. Medical officers of health should have available the assistance of a team of investigators comprising a research medical officer, a statistician, clerical assistants, punch-card machinery, a calculating machine, and field workers for special inquiries. Just as to-day the M.O.H. referred clinical cases to experts, so should he refer his statistical and research problems.

Mr. W. P. D. Logan (London) briefly outlined how the General Register Office dealt with morbidity statistics for sickness surveys, registration and follow-up of cancer, hospital investigations, and school absenteeism.

COMBINED MEETING OF SECTIONS OF CHILD HEALTH AND RADIOLOGY

Friday, July 2

Malignant Disease in Infancy and Childhood

A combined meeting of the Sections of Child Health and Radiology discussed malignant disease in infancy and childhood, with Sir Leonard Parsons (Birmingham) in the chair. Opening the discussion, Professor Wilfrid Gaisford (Manchester) said that the importance of malignant disease in paediatric practice had been thrown into relief by the decline in mortality from infectious diseases. Most children dying from malignant disease were under 5 years of age. Not all malignant cases were curable. Certain forms of malignancy if treated early carried an increasingly good prognosis. The majority of curable cases of cancer also occurred in children of less than 5 years. Intracranial tumours, leukaemia, and kidney tumours were the three commonest forms of malignancy. Astrocytoma and medulloblastoma were the commonest intracranial tumours and were often curable. Radiotherapy gave good results in cases of medulloblastoma and neurosurgery in cases of astrocytoma. Improvement of symptoms within a week of beginning radiotherapy was suggestive of medulloblastoma. In cases of medulloblastoma, unlike other intracranial tumours, the basal metabolic rate was raised. Diagnosis was often delayed. Staggering was a common first symptom, and others were vomiting, headache, and pains in the legs. Vomiting might persist over weeks and months and was cyclical in character in 4 out of a series of 14 cases; 9 of these children were alive three years after the diagnosis was first made.

Abdominal swelling in an infant called for examination to exclude Wilms's tumour. In a series of 15 patients with Wilms's tumour 10 died within two years and 5 were alive three years after the diagnosis. The first symptoms or signs were swollen abdomen (6), haematuria (4), abdominal pain (3), and a palpable tumour (2). Wilms's tumour might give rise to unexplained pyrexia. Suprarenal neuroblastomata were extremely radiosensitive; Wilms's tumours were not. A painless enlargement in the scrotum should raise the question of carcinoma. The inguinal glands were enlarged in the absence of scrotal involvement. *X* rays would reveal lung metastases, which were not uncommon. The prognosis was good in the absence of metastases. Statistics suggested that leukaemia was on the increase; early diagnosis was difficult. In contrast with leukaemia lymphosarcoma and Hodgkin's disease were radio-sensitive. Cure could only be hoped for in lymphosarcoma. The presence of a cardiac bruit, fever, and limb pains in leukaemia could lead to confusion with rheumatism. Professor Gaisford said that some tumours (mainly sarcomata) were congenital. Others, such as retinoblastoma and neurofibromatosis, appeared to be influenced by genetic factors. Neoplasms appearing in childhood might affect growth and metabolism. Treatment might be curative or palliative.

Radiological Diagnosis

Dr. C. G. Teall (Birmingham) emphasized that radiology was not a short cut to diagnosis. Radiographic examination could not establish the exact nature of a lesion or whether it was or was not malignant in the early stages of disease. Kidney tumours in the early stages showed a dense uniform shadow which might displace the intestine. Intravenous pyelography revealed renal deformities but could not differentiate embryoma from neuroblastoma, though it might assist greatly in assessing the condition of the opposite kidney. In the late stages Wilms's tumour was suggested by lung metastases, and neuroblastoma by secondary deposits in the skull and long bones. A retroperitoneal sarcoma displaced the kidney forward. The kidney shadow was large or small according to whether the radiograph was taken with the patient supine or prone. *X* rays were of value in localizing intracranial tumours, the majority of which were subtentorial. Increased intracranial pressure with a rapidly growing tumour might bring about opening of the sutures. Ventricular dilatation resulting from back pressure could be demonstrated by ventriculography. Erosion of the dorsum sellae in the presence of cerebral tumours was less common in children than in adults. A high proportion of tumours of Rathke's pouch showed calcification. Osteogenic sarcomata could not be differentiated radiologically from Ewing's tumour in the early stages, and either might be indistinguishable from inflammation. Osteogenic sarcomata were radio-insensitive; Ewing's tumour might benefit from radiotherapy. The use of biopsy should be accepted in order to make an early diagnosis. Certain bone changes, including a form of irregular cortical absorption, were typical of leukaemia. Dr. Teall said greater use should be made of radiological investigation in doubtful cases.

Radiotherapy

Professor J. S. Mitchell (Cambridge) said the treatment of malignancy in children emphasized the shortcomings of modern radiotherapy. It was probable that gross structural chromosome changes formed the basis for the degeneration and death of cells following irradiation. Inhibited synthesis of thymonucleic acid might explain the mitotic inhibition induced by radiation. The associated disturbed nucleic acid metabolism might be related to increased cell differentiation. The formation of a heparin-like anticoagulant was specially important in children in relation to dosage. In children as compared with adults special care was necessary in considering the effects of radiation upon the epiphyses, the endocrine glands, and the lens, and in producing late vascular changes. The distinction between radio-curability and radio-sensitivity was accentuated in children. It might be assumed that effective radiotherapy in children called for methods of fractionation and for time factors differing from those employed in adults. The treatment of choice for renal tumours was surgery followed by irradiation in early cases, and pre-operative irradiation and surgery or radiotherapy alone with a long over-all time in late cases. Surgical treatment with post-operative irradiation in cases of retinoblastoma was discussed. In unilateral retinoblastoma excision of the eye and extensive removal of the optic nerve were essential. If the optic nerve was involved a radon seed should be implanted. For bilateral ocular involvement radon seeds might be stitched to the sclera. In cases of cerebellar medulloblastoma irradiation of the anterior cerebrum should be omitted, owing to the possibility of delayed vascular changes. Ewing's tumours called for radical treatment. Professor Mitchell discussed a small series of cases of malignancy in children and adolescents. The series included a case of radio-curable rhabdomyosarcoma in a boy aged 17 years. All apparently cured cases of malignant disease in children should be systematically followed up. The use of radio-active isotopes in children was contraindicated even for the purpose of tracer investigations.

Pathology

Dr. A. M. Barrett (Cambridge) grouped tumours in childhood into those more common in childhood than adult life, those occurring at any age, and those which were more frequent in the adult subject. The embryonic tumours were unlikely to result from exposure to external carcinogenic factors. Recent studies had emphasized the multicentric rather than the unicentric background to these tumours.

Dr. Frances Braid (Birmingham) mentioned a case of Wilms's tumour in an infant of 7 weeks. The symptoms suggested pyloric

stenosis. The baby was alive 2½ months after radical surgery. Dr. R. M. Mayon-White (Cambridge) mentioned the necessity for the minimum of handling of a Wilms's tumour in the interval between diagnosis and the commencement of therapy. Professor G. B. Fleming (Glasgow) drew attention to the difficulties of differentiating these tumours from tuberculomata and from abdominal tuberculosis. Professor R. W. B. Ellis (Edinburgh) emphasized that although malignant disease was rare in children benign tumours—for example, naevi—were extremely common. Certain benign tumours were potentially malignant in later years.

Replying to Dr. Janet Roscoe (Cambridge) Dr. Teall said that intravenous pyelography was practicable in infants aged 2 and 3 weeks. Dr. S. Cochrane Shanks reinforced Dr. Teall's plea for co-operation between clinicians and radiologists and instanced the value of discussions.

The Weights of Normal Neonates

In the afternoon a demonstration was arranged at the Cambridge County Maternity Unit. Dr. Janet Roscoe (Cambridge) described preliminary studies carried out on the weights of normal neonates in the first ten days of life. All feeds had been complemented with dried milk in 203 infants during the first three days of life; 130 infants received breast milk only. The post-natal weight loss was less in infants receiving complementary feeds. Recovery from initial weight loss was more rapid in infants fed on the breast alone, and on discharge on the ninth day their weights compared favourably with the weights of babies on complementary feeds.

SECTION OF RADIOLOGY

Thursday, July 1

A.—RADIODIAGNOSIS

The Small Intestine in Nutritional Disorders

With the president, Dr. S. Cochrane Shanks (London), in the chair, Dr. R. A. Gregory (Liverpool) surveyed the physiology of intestinal movements. He said that the motility of the small intestine determined to a large extent the normal progress of digestion and absorption by mixing the intestinal secretion with the food and bringing this into contact with the mucosa, and by moving the contents down the intestine at a rate commensurate with the progress of digestion and absorption. The results of observations and experiments on humans and animals indicated that certain forms of movement were consistently found during digestion: (1) "pendular" movements, consisting in gentle waves of contraction which pass repeatedly down a segment of intestine, causing it to lengthen and shorten rhythmically; (2) "peristalsis," a strong slowly moving double wave of contraction above and relaxation below some point of stimulation; (3) "segmentation," the repeated and rhythmical division of a length of intestine into several segments by relatively stationary contraction-waves; and (4) "rush waves," a rapid vigorous contraction extending for considerable distances down the bowel, seen characteristically in diarrhoea and similar conditions as well as during normal digestion. The gut as a whole was "polarized" in that the movements tended to pass *downwards*.

The evidence that peristalsis resulted from a local reflex (myenteric reflex) in the enteric plexuses, while segmentation and pendular movements were of myogenic origin, was discussed in relation to the structure of the enteric plexuses and other work. The extrinsic nerves normally exerted a mutually antagonistic influence on the general activity of the intestine; complete denervation of the small intestine was followed by a "paralytic" increase in tone and motility lasting several days. The splanchnic nerves formed the reflex pathway for intestinal inhibition (ileus) produced by afferent impulses from the peritoneum, abdominal organs, etc.; splanchnic section or anaesthesia of the abdominal ganglia or of the spinal cord abolished the inhibition. A number of observations indicated that the passage of intestinal contents down the gut was controlled by the acidity, and perhaps also the chemical composition, via reflexes originating in chemoreceptors in the mucosa.

Dr. F. R. Berridge (Cambridge) had examined 78 cases in north Germany in 1946 under the auspices of the Medical Research Council. There were many nutritional disorders. All his cases had at some time suffered from famine oedema, and many were oedematous at the time of examination. In the radiological examination he gave by mouth 100 g. of barium sulphate suspended in 100 ml. of normal saline. The Miller-Abbot tube was time-consuming and had no special advantages. The patients were all examined lying down. In the normal subject the mucosal folds decreased in height and number from the upper to the lower end of the small intestine. The lumen of the gut narrowed from above downwards and movement decreased from above downwards. Normally the barium entered the small gut in a continuous stream and remained as such until it reached the colon.

Of the 78 German cases 32 were normal and 46 abnormal. The latter showed fragmentation of the barium column, mostly in the mid-jejunum and upper ileum. The rugae, whose normal width was about 2 mm., were widened to 4 mm. and were more widely separated. Flocculation also occurred—i.e., fragments of barium remained in the jejunum and ileum after the main mass of barium had passed on. Previously this feature was said to occur only in steatorrhoea. Another feature he found, also seen in steatorrhoea, was a smooth outline of the upper jejunum.

The only common factor in all the abnormal cases had been loss of weight and at some time famine oedema. The vitamin deficiencies had been so various that no particular one could be attributed as cause.

Dr. Wilfrid Sheldon (London) contributed a paper on coeliac disease. He said that the term "coeliac syndrome" was criticized adversely because it was maintained that by clinical examination and laboratory investigation other causes of steatorrhoea, abdominal distension, and wasting in young children could be differentiated. Those conditions included abdominal tuberculosis, *Lamblia* infection, chronic septic infection, and fibrocystic disease of the pancreas. He accepted the value of analysing the enzymes in the duodenal juice, and of trypsin in particular, in distinguishing between pancreatic fibrosis and coeliac disease, and he outlined the dietetic treatment of the former condition. He questioned the customary interpretation of faecal-fat analysis and the flat oral glucose absorption curve in coeliac disease. While faecal-fat analysis might have some diagnostic value in coeliac disease it was not a good guide to treatment.

Dr. D. A. K. Black (Manchester) said that the most important small-gut disease in adults was steatorrhoea—a bad name, for the defect was certainly not limited to fat absorption. Glucose was also poorly absorbed, and in severe cases of sprue even water and salt were poorly absorbed. Deficient fat absorption was partial, at least 50% being absorbed, and in many cases as much as 70%. Unabsorbed fat might irritate the colon and thus cause diarrhoea. That could be checked to some extent by administering calcium salts, which probably precipitated the soluble soaps, which were less irritant.

One of the features of steatorrhoea was its pleomorphism. Some cases might have normal stools and no diarrhoea. Sprue might present as a refractory anaemia, not necessarily of the macrocytic type. This made diagnosis very difficult, and radiological investigation, particularly with the aid of drugs, was necessary.

Professor A. C. Frazer (Birmingham) said that he and his colleagues had attempted to produce an abnormal pattern of barium in the small bowel of normal subjects. By adding products of fat digestion to barium sulphate they had constantly succeeded, both by the oral method and by intubation. Giving ordinary fat with barium did not cause segmentation of the meal. One must hydrolyse the fat. The segmental pattern could be restored to normal by giving calcium, which removed the fatty acid.

The Pancreas

In the afternoon Dr. Kemp Harper (London) spoke on calcification, calculi, and cysts of the pancreas. In ordinary radiological practice calcification was rarely seen in the pancreas, perhaps partly because plain films of the abdomen were relatively rarely taken. Ludin had *x*-rayed 2,000 cadavers and had

found pancreatic calcification in 81. At necropsy 55 had showed calculi, 10 calcification, and 16 ossification of the pancreas. Pain was the outstanding symptom of pancreatic calculi, and it might radiate to the back and shoulders. Diarrhoea and steatorrhoea were not uncommonly associated. Alcoholism was said to be a causative factor. The calculi were often multiple and might be as large as walnuts; they sometimes filled the whole pancreas. One-third of the cases had diabetes.

Calcification occurred in the parenchyma, calculi in the ducts. Calcification might be patchy or widespread. It had to be differentiated from gall stones, renal stones, calcified lymphatic glands, calcified aorta, aneurysm of the renal or splenic arteries. Lateral radiographs were of assistance, but one might have to fill the alimentary, biliary, and renal tracts with contrast medium before one could be certain of the diagnosis.

He followed Grey Turner's classification of true and false cysts. The former were divided into acinous, fibrocystic, and interacinous, which in turn were subdivided into lymphatic and parasitic. The false cysts might be intraperitoneal or retroperitoneal and were caused by injury, pancreatitis, or neoplasm. Injury caused 20% of false cysts, and the history might vary from three days to six years.

Dr. C. J. C. G. Hodson (London) described five cases of uraemic pneumonia. The disease was seldom seen radiologically because the patients were so ill. It was not a pulmonary infection but due entirely to oedema. The lesion started at the hilum on one or both sides and spread peripherally, not respecting the interlobar fissures. This was unlike any form of pneumonia. There was solid oedema, the alveoli being blocked with fibrin, but there was practically no cellular infiltration. The same picture was seen at all ages and usually lasted till death. The patient could recover; if he did the lung cleared in a few days. Two of his five cases had recovered. Radiology might help in assessing prognosis.

B.—RADIOTHERAPY

Radioactive Isotopes

With Dr. Frank Ellis (London) in the chair, Professor O. R. Frisch (Cambridge) said that all elements had radioactive isotopes—isotopes whose nuclei were unstable. For practical purposes there were three types of activity: (1) alpha-radioactivity, when the nucleus eventually emitted an alpha particle (a fast-moving helium nucleus); (2) beta-radioactivity, when a positive or negative electron (beta particle) was emitted—these beta particles had a continuous energy distribution; and (3) radioactivity in which only radiations (and maybe electrons from the shell) of well-defined energy were emitted. Most of the radioactive isotopes in use were produced artificially by bombarding some stable element either with fast-moving ions (e.g., from a cyclotron) or with neutrons from a fission pile. Many of them could be produced in fairly concentrated form by the use of chemical separation methods.

Concerning therapeutic uses, the replacement of radium by cobalt[60], an artificial gamma-emitter, was mentioned. For beta-ray treatment phosphorus[32] and strontium[89] and strontium[90] should be of value. The method of depositing a suitable isotope or special compound of one at the appropriate place in the organism by utilizing their metabolic properties was probably capable of considerable development. The use of radioactive tracers for the study of metabolic and other problems was briefly discussed, including the possibility of using two different active isotopes of one element to distinguish between two simultaneous sources of supply. Geiger counters were mostly used to measure the small activities involved. Recently an alternative system had been tried, based on recording the small light-flashes which fast electrons produced on their passage through naphthalene. A detailed picture of the distribution of an active isotope in a tissue could be obtained by auto-radiography; a thin section of the tissue was placed in contact with a photographic emulsion which was subsequently developed. Recent improvements included emulsions poured direct on to the sample, and, on the other hand, the use of an electron microscope to form an enlarged image by focusing the electrons emitted. For this latter method the tracer must show the third kind of radioactivity in which electrons of well-defined energy were emitted.

Tracer Applications

Dr. A. S. McFarlane (Hampstead) pointed out that the tracer application of isotopes had revealed that the appearance of permanence in adult tissues was purely superficial and that there existed a state of intense intracellular chemical activity. The destruction of old materials was so balanced by the synthesis of new that no metabolic balance sheet could detect this activity, but only the use of isotopic tracers. Many surprising features emerged. For example, the nucleus of the adult cell was to be classed among the metabolically inert structures of the body except in abnormal states. In malignant and regenerating tissues it came to life and took an active part in cell metabolism. In all cells some chemical reactions were favoured by the enzyme heritage of the cell and proceeded rapidly while others continued slowly or not at all. A large part of modern biochemistry was directed towards finding out the favourite reactions by a "precursor" type of experiment. For example, C^{14}-labelled phenyl alanine gave rise to labelled adrenaline which had been isolated and crystallized. The rise and fall of adrenaline radioactivity followed more closely that of the phenyl alanine than that of any other suspected substance, and phenyl alanine was therefore the nearest known precursor. In this way also, for example, the ring structure of uric acid in pigeons had been pieced together from simpler components. From a vast amount of work of this kind a new biochemistry was being written which would take some years yet for assimilation and ultimate formulation in textbooks. It represented an enduring contribution to our knowledge of life processes and must ultimately have repercussions on clinical medicine. There was also another major and perhaps more spectacular type of application in which the tracer was used as a non-specific indicator—for example, of thyroid function, or blood flow, or capillary permeability. Supplies of isotopes were now adequate for all tracer needs on a national scale and some sixty biological projects were in progress, the materials being issued by the Medical Research Council.

Radioactive Isotopes in Therapy

Professor J. S. Mitchell (Cambridge) said that the radioactive isotopes with possible therapeutic applications might be classified according to their method of use, either by internal administration or as external sources (including the interstitial use of other substances as substitutes for radium or radon). In the first group, of the substances which were selectively concentrated, most practical experience had been obtained with the soluble inorganic forms of phosphorus (P^{32}) and iodine (I^{131} and I^{130}) while experimental work had been done with: (*a*) soluble inorganic compounds including: calcium[45], strontium[89], arsenic[74] and arsenic[76], and element 85[211]; (*b*) colloidal inorganic compounds, including phosphorus[32], manganese[52], gold[199], zinc[65]. Applications of such compounds were found in the treatment of reticulo-endothelial diseases and the so-called "injection implant." Also of this type, but giving uniform distribution as contrasted with the selective absorption of the previous examples, were compounds including sodium[24].

For "external" radiation the most promising elements were: (*a*) As gamma-ray sources: cobalt[60] and tantalum[182], which had been used in practical and experimental work. Some work had also been done with unseparated fission products—zirconium[95], columbium (niobium)[95], barium[140], lanthanum[140], and iodine[131]; (*b*) As beta-ray sources. Here phosphorus[32] was the best known, while the experimental possibilities of strontium[89], yttrium[91], uthenium[106] and rhodium[106], cerium[144] and praseodymium[144], dysprosium[165], and iridium[194] were being studied. Investigations on this last group were carried out in the Cambridge University Department of Radiotherapeutics and the preliminary results appeared promising.

The most promising applications of radioactive isotopes appeared to be in the field of tracer studies, and it was of the greatest importance, both in the tracer and therapeutic applications, that there should be comprehensive and accurate knowledge of the dosimetry involved. The importance of this information, particularly in tracer work, where the small quantities of active material employed might induce carelessness, could not be over-emphasized. The isotopes most used at present, radiophosphorus (P^{32}) and the eight-day radio-iodine (I^{131}), were then considered in more detail.

Radiophosphorus (P^{32}).—Physical properties: half life 14.3 days. Radiation: negative beta rays only. Energy: maximum 1.712 ± 0.008 Mev; mean 0.70 Mev. Range in water: maximum 0.82 cm. Assuming a constant concentration, 1 microcurie per gramme of tissue delivered 38.5 r per 24 hours, so that without allowance for excretion a dose of 1 r was delivered by 1.26 microcuries destroyed per kg., or, assuming an effective half life of 11 days to allow for excretion, 10 r was given by 1.15 millicuries destroyed in a 70-kg. patient. These calculations were based on the relation that 1 r of radium gamma radiation with normal filtration corresponded to the absorption of 93.1 ergs per gramme of water. Other published data on dosage, particularly by American authors, had been based on air absorption with a conversion factor of 83 ergs per gramme, and the values given (for example by Low Beer and Kamen) would therefore require a corresponding adjustment for comparison. The differential absorption ratio must also be taken into consideration, and approximate values were 1.5 for normal red bone marrow and 2.5 for normal lymph nodes. In practice these differential absorption rates were too low for successful therapeutic purposes, and the most promising applications appeared to be in the case of leukaemia and allied diseases and especially for polycythaemia vera.

Radio-iodine (8-day; I^{131}).—Physical properties: half life 8 days. Radiation: negative beta rays and gamma rays. Energy: beta rays, maximum 0.6 Mev, mean 0.205 Mev; gamma rays, 0.367 and 0.08 Mev (85–90%), 0.65 Mev (10–15%). Range in water of beta rays: maximum 0.22 cm. 1 millicurie per gramme of tissue delivered 7.83 r per minute, so that without excretion 1 microcurie destroyed per gramme gave a dose of 130 r, or, assuming an effective half life of 6.32 days to allow for excretion, this dose was reduced to 103 r. It should be noted that the normal thyroid weighed 25 ± 5 g. and contained 10–15 mg. of iodine.

An example of the type which might occur in practice was: hyperthyroidism—for 80% fixation of I^{131} in a thyroid weighing 60 g., 4 millicuries administered by mouth would produce a total dose of approximately 5,500 r in a mean time of 9.1 days; carcinoma—assuming in this case 50% fixation in a tumour weighing 300 g., 58.4 millicuries gave a total dose of about 10,000 r.

In the discussion which followed Dr. Leo Wislicki asked how to relate doses of radioactive elements to the weight of various types of goitre, and also if it was possible to measure the distribution of radioactive elements in the different parts of the living animal.

Professor Mitchell agreed that most calculations and work done with models of thyroids were subject to very serious limitations, and great accuracy was not to be expected; all gave results based on an average concentration assuming uniform distribution. Dr. McFarlane replied that there was considerable information on distribution, and mentioned particularly sodium and iodine, although most of the results were based on animal experiments. With an external counter the accuracy of localization was not very high. Dr. C. J. L. Thurgar (Newcastle-upon-Tyne) wanted to know what happened, in the treatment of carcinoma of the thyroid by radioactive iodine, to that proportion of the iodine which was not fixed by the tumour. He stated that to deliver a dose of 10,000 r to the thyroid with I^{131} it was necessary to give between 50 and 60 mc of the isotope, of which 50% was fixed. Was the remainder excreted rapidly, and did the heavy dosage employed result in any undesirable side-effects using either of the radioactive isotopes of iodine? Professor Mitchell explained that part of this was excreted fairly rapidly, although the possibility of renal damage in the process and storage elsewhere must always be considered. Dr. F. T. Farmer (Newcastle-upon-Tyne) said it seemed clear that except in the case of iodine the selective absorption of isotopes in various parts of the body was very slight and held little promise for the treatment of tumours. The alternative possibility of preparing an organic compound which was taken up by the body and concentrated into tumour tissues, and which could be made radioactive by the inclusion of a suitable isotope, was one which seemed to hold considerable promise, and he asked what progress had been made in this direction. Professor Mitchell replied that much work had been done, with negligible results. An alternative approach was the use of inactive substances to increase the subsequent uptake of the radioactive materials, an example being the administration of thiouracil.

Discussion

Dr. Frank Ellis (London) referred to the example quoted by Professor Frisch of K-electron capture in vanadium^{50} followed by the emission of *x* radiation, and asked whether it would be possible to obtain an element suitable for absorption in tissue and transforming in this way with the emission of characteristic radiation of wavelength about 4 Ångstrom units, which would be expected to be most effective for chromosome breakage. Professor Mitchell thought the substances of this type would be difficult to obtain, but drew attention to the possibility of using isotopes emitting alpha particles with energies of the order of 6 Mev and a range of 15 μ, which would have a high efficiency in chromosome breakage. Professor Frisch emphasized that K-capture transformation occurred mainly with elements heavier than calcium—for example, in the region of zinc and nickel—but that consequently the characteristic radiations were harder than was desirable. Dr. Ellis asked Professor Mitchell about the genetic effects likely to be caused by tracer amounts of isotopes. Professor Mitchell explained that such effects would be limited to a small fraction of the population and in most cases would be of the nature of deleterious recessives and so not visible for generations; also translocations and semi-sterility would be probable types of changes. Dr. Ellis described work which had been started at the London Hospital with thorium X injected into the bladder in order to make use of the short-range alpha particles. It had been found that the thorium X was deposited on the bladder surface, and the resulting intimate contact made it possible to use smaller amounts than was at first expected. When phosphorus^{32} was used in the hope of getting greater radiation penetration there was no similar "sticking" to the surface, and much larger quantities were required. It was hoped that by the choice of a suitable phosphorus compound this could be improved. It was found that, for such intracavitary applications as in the case of the bladder, thorium X had advantages over the normal use of *x* rays.

SECTION OF OCCUPATIONAL HEALTH

Friday, July 2

Aviation Medicine Applied to Civil Aviation

Professor Ronald E. Lane was in the chair when Air Marshal Sir Harold Whittingham, opening the discussion, said that aviation medicine was divided into two main sections, one which dealt with ground staff and concerned a variety of trades common to many branches of industry, while the other appertained to flying proper. Emphasis was laid on the physiological, psychological, and hygienic problems concerned, particularly with regard to selection of air crew and the maintenance of their efficiency during flight. He stressed the importance of safety and comfort for both air crew and passengers in civil flying and gave a brief review of the main advances in aviation medicine as applied to civil aviation. These advances were divided into two groups—namely, those which had originated in Service researches during the war and those now being undertaken by research workers employed by the British Airways Corporations working in collaboration with their Service colleagues at the R.A.F. Institute of Aviation Medicine. The chief items discussed were air sickness; air conditioning of pressurized aircraft; oxygen equipment; aircraft accidents—with a plea for backward-facing seats; flight schedules and their relation to fatigue; retiring ages for various members of air crew; seat design, safety belts, and life jackets; the maintenance of safe water and food supplies on air routes and the use of the deep-freezing technique for pre-cooked foods; and the disinsectation of aircraft and other quarantine problems, including the standardization of vaccines and the technique of preparation and inoculation.

Physiology of Stratosphere Flying

Wing-Commander A. K. Stewart (Farnborough) said that, as compared with ordinary military or civil flying at altitudes up to 30,000 ft., stratosphere flying would probably be characterized by little turbulence; in addition, the moisture content

of the air was extremely low; there was no appreciable dust, smoke, or foreign materials; and the conductivity of the air and the intensity of cosmic rays were markedly increased. With the introduction of jet propulsion, altitudes of 60,000 ft. were reached. The aircraft were not specially designed for high altitude flying, and the main feature enabling this height to be reached was of course the pressurization of the cabin. All aircraft, whether military or civil, flying routinely at altitudes above 30,000 ft. would obviously be pressurized in the future. The general physiological problems arose from the fact that the troposphere had to be passed through twice; the initial problems of take-off, ascent, and descent were basically similar to those of more routine flights. Descent might be extremely trying under conditions of fuel shortage necessitating a limited rate of descent. In small aircraft pilots had been known to have a psychological aversion to high flying. Apart from being pressurized it would be necessary to be able to control the environmental conditions in the cabin and to add moisture to the air; new problems of temperature control in large aircraft might be encountered. The more specific problems would include the stress involved in the constant apprehension of loss of pressurization. The consequences of this varied, but the main danger was the onset of acute anoxia. In the case of subjects suddenly exposed to low pressures while breathing 100% oxygen at 33,500 ft. the condition would approximate that at sea level; at 40,000 ft. it would be equivalent to that of flying at 10,000 ft. while breathing air; at 44,000 ft. it would be equivalent to 19,000 ft. whilst breathing air. Most individuals would become unconscious in roughly 30 to 90 seconds with such a change at 47,000 ft., so that it was essential that the efficiency of the pressure cabin should be absolute. Low atmospheric pressures tended to produce bubbles in the tissues and fluids of the body, and in a small proportion of subjects these might cause central circulatory or cerebral collapse. Above 63,000 ft. there was an additional risk of the conversion of the body fluids into vapour, and puffy swellings of the limbs might be noticed. The consequences were not inevitably lethal provided that the descent was quick enough to exclude death from anoxia. There might be expansion of gases in body cavities causing acute abdominal pain, acute pain in the middle ear, or pain in the sinuses. If the loss of pressure was sufficiently sudden, damage to the alveolar tissue of the lung and mediastinal emphysema might result. Provided that the engineering, aerodynamic, and ancillary problems were satisfactorily solved flight in the stratosphere should be preferable to flight at low altitudes, especially for long journeys, in view of the great reduction in the time spent in the aircraft.

Fatigue in Flying

Sir Frederic Bartlett (Cambridge) said that nobody knew whether there was a single process underlying all manifestations of what was called fatigue. Without making any assumptions, this "fatigue" had to be taken as including all demonstrable changes of activity due to the continued exercise of that activity under its normal range of conditions. In flying these changes might be studied (*a*) in the air crew, and (*b*) in the passengers, though practically nothing definite was known about passenger fatigue. Practically all air-crew operations depended upon matching particular sensory changes, involved usually in the interpretation of instruments, with timed and co-ordinated muscular response. If operations of this kind were well designed the evidence was that significant deteriorations of efficiency were extremely slow to develop. Under present conditions, however, deteriorations of air-crew skill did set in within the time range of many normal flights. There were three principal diagnostic signs of normal fatigue in air crews: (1) A bigger receptor change was required to set up any muscular response; the result of this was ragged timing of operative movements. (2) A greater prepossession with how the body was working set in and feelings of discomfort became more and more prominent. (3) There was evidence that the "anticipatory span" of action might become restricted. The notion of a single quick decisive fatigue test, or any collection of such tests, was highly misleading. Passengers were said to suffer more from boredom than from fatigue, but the objective effects were much the same. Some suggestions for investigation were made.

Air Marshal P. C. Livingston (London) said that it was absolutely essential that there should be discussion of these problems, and anyone who could contribute anything to it should do so. Aviation medicine must not become specialized, because without a general knowledge of all related subjects it would be difficult to guide oneself through many of the mazes of aviation medicine. He showed some slides to illustrate the manner in which findings in aviation medicine had already contributed to general medicine.

SECTION OF OPHTHALMOLOGY

Friday, July 2

Significance and Interpretation of Refraction

With a vice-president, Mr. J. H. Doggart (London), in the chair, Mr. E. G. Recordon (Cambridge) opened the discussion by deploring the present standard of refraction. He based his observations on his work with the armed Forces. He said that many unnecessary pairs of glasses were ordered, these being either small corrections or slight alterations of existing lenses. Refractionists generally considered that the technique of refraction was easily mastered and they persisted with bad technique for years. Better teaching was required. Refraction was an assessment of the physico-psychological complex. Bad habits could be avoided by remembering, first, to avoid slavish routine, and, secondly, to undertake self-criticism—without the latter, experience was useless; it meant the repetition of the same mistake. Mr. Recordon considered that there should be a more realistic and imaginative approach to the problems of refraction. Several apparent virtues when carried to excess became faults in a refractionist. Plotting a curve of his clinical results enabled the practitioner to see the variations in his prescribing. Finicky prescriptions were usually wide of the mark. "Quarter splitters" were concentrating on mechanical perfection and striving for intrinsically and theoretically impossible accuracy. Patience, he went on, was not always a virtue; refraction could descend to mere trial and error, resulting in bad prescribing. The patient became worried and was unable to select the most restful lenses. The true function of glasses was to permit the eye to function with maximum relaxation. A low visual acuity only was suggested by a large refractive error giving rise to no symptoms, but if headache and eyestrain were present the patient had not been living within the limits of his ocular economy and ciliary dysfunction was indicated. In order to bring the ciliary muscle to order every guile and art of refraction was required. Mr. Recordon then indicated a few details which he had found useful.

The unaided vision should be recorded at the end of the examination, since ciliary relaxation was the aim. He used a six-metre dark-room with the patient fixing a distant spotlight during the refraction. Both eyes should be tested together, cylinders being essential for accurate retinoscopy. Time might be necessary to obtain relaxation and the acceptance of full correction. A few seconds only should be allowed for monocular chart reading. The subject of cycloplegics he did not discuss except to say that he employed the response of the eye during refraction to determine their use. He then stressed the desire for more symmetrical prescribing. He thought the simple law of symmetry applied to the eyes more often than not, though it was the exception rather than the rule to find this in prescriptions. Five consecutive prescriptions from his out-patient department were then reviewed critically. In closing, he said that in a presbyope with severe symptoms hyperphoria should be suspected and prisms ordered to correct this. Prisms should not be used for lateral phorias in his opinion. "Take care of your spheres and your prisms will take care of themselves" was, he thought, a fitting aphorism.

Mr. Arthur Lister (London) continued the discussion, agreeing with Mr. Recordon that each refractionist considered his method the ideal. He went on to say that the significance of small refractive errors was much exaggerated. It was his principle never to prescribe for a myopic error of less than minus three-quarters of a dioptre, a hypermetropic error of plus one and a half to two dioptres—depending on the age and occupation of the patient—and an astigmatism of less than plus or minus one dioptre.

He stressed the point that headache might be a symptom of a general disease and that more attention should be paid to the taking of a case history as in other branches of medicine.

The significance of refraction in relation to general and ocular diseases was then discussed. Diabetes mellitus was the disease most commonly affecting refraction, though it was strange that, according to Sir Stewart Duke-Elder, only 10% of diabetics noted any change. The change was probably due to alterations in the size of the lens, since in one unilateral aphakic patient the changes occurred in the normal eye only. Spectacles, he said, should not be ordered until the diabetes was fully stabilized.

Patients with psychosomatic disorders affecting accommodation might complain of dimness of vision due to temporary failure or irritability of accommodation. When occurring in otherwise healthy young adults this might be cured by glasses for close work only. A case of Mr. H. Neame's was quoted of a girl with myopia whose sight was partially improved by glasses, but after leaving home to do war work which she enjoyed the myopia disappeared and the sight became normal. Other causes for changes in refraction included pressure on the globe by small tarsal cysts or lacrimal gland swelling, mild degrees of conical cornea, and central serous retinitis. Glaucoma was said to cause premature presbyopia, but he had never seen a case. Finally, he considered errors of refraction which might be the direct cause of eyestrain, defective vision, and imbalance between accommodation and convergence. The latter was the undoubted cause of a number of squints, and in these cases defective vision might result in amblyopia ex anopsia. Psychological disorders might occur in children from defective vision, and eyestrain might set up a chain of events leading, rarely, to murder or suicide. A rational view of the patient's symptoms must therefore be given him as well as a pair of spectacles.

The third speaker, Mr. Victor Purvis (London), began by saying that a busy clinic refractionist could not allow himself to remember that refraction was more than a rapid retinoscopy and a slick subjective test, but that even if time were taken to examine the patient carefully there was a difference between practice and precept and an extraordinary disparity between one surgeon and another. Refraction was an estimation of the patient's ophthalmic equipment and ocular requirements; therefore it was a matter for congratulation that prescriptions were so much alike. The aim was ocular comfort for the patient without making the test too strenuous either for the patient or for themselves. The method of retinoscopy was unimportant so long as the results were the same. Without a cycloplegic, retinoscopy was inaccurate as the refraction was not taking place along the true axis; to reduce the error so far as possible the right eye should be used for the patient's right eye and vice versa.

Mr. Purvis went on to discuss the advantages and disadvantages of cycloplegics, favouring the use of oily as opposed to watery homatropine. Atropine he reserved for squinting children. He admitted that cycloplegics took longer to act in the coloured races and when the iris was dark. He prophesied that non-luminous mirrors would soon be outdated by the electric retinoscope. Agreeing with Mr. Recordon that speed in testing was essential, since the basis of the test was contrast, he went on to say that the examiner must take charge of his patient. The attention of the ciliary muscle and of the mind must never be allowed to wander. The most accurate subjective testing was carried out with the aid of crossed cylinders, especially for estimating astigmatism, with a duochrome test for the final checking. He would not put any person into glasses if they were comfortable without, whether they could see 6/5 or not, excepting the growing child, who in this competitive age should be given as good sight as his fellows.

During the discussion which followed Miss Margaret Dobson (London) said that she thought prisms were useful for exophoria but not for esophoria. Mr. R. F. Lowe (Melbourne) thought the relations between ophthalmologists and opticians required clarification, since the surgeon could not be responsible for the refractions undertaken by opticians, who were not always accurate. Mr. Lister disagreed with this; he thought the work of the majority of opticians was most accurate. Dr. Jamna V. Dhurandhar (Bombay) said that many cases of presbyopia took maximum reading corrections at the age of 45. Mr. Recordon replied that in his opinion this was due to distance under-correction.

Mr. O. G. Morgan (London) thought that presbyopic corrections were generally too strong and that a patient should be encouraged to leave off his glasses whenever possible. Dr. J. Berkson (Liverpool) said that in presbyopes often retinoscopy suggested that cylinders were not needed, but the addition of half a dioptre cylinder would increase the vision. Dr. Ryan (London) believed that more time should be devoted to the teaching of refraction and especially the interpretation of retinoscopy findings. Mr. L. G. Scoular (London) had found that 60% of patients had the left eye higher than the right and this should be taken into consideration when ordering glasses with cylinders. Dr. Duncan (Leicester) brought up the question of postural headaches and pseudo-myopia in children, and Dr. M. L. Mistry (Bombay) cited the case of a woman with bilateral dilated fixed pupils.

In the afternoon a clinical meeting was held at Addenbrooke's Hospital and films on the following subjects were shown: operations for detachment by Stallard; intra- and extra-capsular cataract extraction; strabismus and glaucoma.

SECTION OF ANATOMY AND ANTHROPOLOGY

Friday, July 2

Present Position of Primate Anatomy

With the president, Professor H. A. Harris (Cambridge) in the chair, Professor Frederic Wood Jones (Royal College of Surgeons of England) opened a discussion on the present position of primate anatomy. He gave a provocative review against a strong historical background and emphasized the gradual growth of that cocksureness and conceit which characterized the zoologists at the end of the nineteenth century, when it was generally accepted that Charles Darwin and Thomas Henry Huxley had filled the cup of anatomical knowledge to the full. It was only at the beginning of this century that doubt was cast on their pronouncements and the renewed use of scalpel and forceps invalidated many of their assumptions and provided facts which were at variance with Darwin's *Descent of Man* (1859) and Huxley's *Man's Place in Nature* (1863).

Professor Wood Jones said that Darwin had no first-hand knowledge of the anatomy of any primates and what he retailed at second hand was strangely inaccurate. Huxley's sole contribution to the study of primate anatomy was one small paper on the brain of *Ateles*, the spider monkey, and his knowledge of primate anatomy was meagre. Yet at this very epoch Richard Owen, the master of comparative anatomy, and St. George Jackson Mivart, the master of primate anatomy, had provided accurate information on the anatomical structure of certain primates. Their findings were entirely at variance with the anecdotal type of information dispersed by Darwin and Huxley. Moreover, Robert Bentley Todd published his great *Cyclopaedia of Anatomy and Physiology* from 1835 to 1859 and it contained Vrolik's accurate article on the "Anatomy of the Quadrumana." The speaker pointed out how Darwin confused the maxilla and premaxilla with the malar bone and how all his notions of the entepitrochlear foramen in the humerus of man were faulty through lack of anatomical examination. Reference to Todd's *Cyclopaedia* would have saved both Darwin and Huxley from their mistakes. Professor Wood Jones traced the final failure of the morphological school from Darwin and Huxley through Haeckel and Bland-Sutton, and showed how the armchair analysis of atavistic structure became fashionable. He gave a rapid survey of the accurate workers in the field from Tyson (1669) on the gorilla, Burmeister (1846) on *Tarsius*, and Alan Thompson (1839) on the ovum to modern times. In particular he stressed the manner in which accurate published information on comparative anatomy was neglected, so that the re-examination of the platitudes of the morphological school was long overdue. He made a plea for the recording of the complete anatomy of a wide series of members of the primates so that clarity of thought might replace the illogical discussions on man's place among the primates.

Professor H. A. Harris (Cambridge) dealt briefly with the use of radiography in tracing the comparative features of growth in the primates. As he had prepared an extensive demonstration of primate specimens with their radiographs, he limited himself to a brief discussion of the growth of the skull and the face and the eruption of the deciduous and permanent dentition, indicating how the order of eruption differed in primates and man. He mentioned the wide variation in the pattern of

development of the sternum, indicating in particular the variations met with in the orang and the gibbon. In the latter the sternal angle persisted as a movable joint at the level of the third costal cartilage, as was seen occasionally in man. He also displayed the absorption or fusion of certain sternebral elements whereby a single sternebra would appear to articulate with three, instead of two, costal cartilages. After describing the interesting bony epiphysis which appeared in the pisiform bone of all primates hitherto examined except man, he showed a series of radiographs of the central mental foramen in the primates. This foramen, in close relationship to the four genial tubercles as an occasional feature in man, transmitted through the symphysis a vascular bundle which was a persistent anastomosis between the sublingual branch of the lingual vessels and the submental branch of the external maxillary (facial) artery. Occasionally a lymphatic gland was situated inside the mandible in this position, and if ulcerated by a denture it easily led to an erroneous diagnosis of carcinoma.

Professor W. C. Osman Hill (Edinburgh) discussed the position of the prosimians and traced the various historical attempts at classifying the lemur-like animals, often called lemuroids. He insisted that the term *Lemuroidea* should be restricted to the fossil and recent forms occurring only in Madagascar, together with certain fossil forms found in Europe and N. America. He placed the Oriental and African loris, potto, and galago in a single group as lorisoids. As to that enigma *Tarsius spectrum*, he gave reasons for placing it in a separate sub-order, *Tarsii*, on account of the discoidal, haemochorial placenta and the mesodermal body-stalk of the embryo. He gave a detailed analysis of the existing and fossil forms and concluded that there was much evidence in favour of regarding *Tarsius* as the most primitive existing primate.

Professor A. J. E. Cave (London) discussed, with numerous illustrations of excellent dissections, the nasal fossa of primates. He indicated the features of the nasal fossa in carnivores, insectivores, and rodents, emphasizing the wide interorbital septum and the complicated system of endo- and ectoturbinals. The *Lemuroidea* presented similar features and so indicated their non-primate status. No true pneumatic cranial sinuses occurred in any of the above forms, although they possessed paranasal sinuses. The primate nasal fossa was totally distinct and displayed a narrow interorbital septum owing to approximation of the orbits, no ectoturbinals, and a relatively simple system of three or four turbinals with true cranial sinuses. Professor Cave outlined the factors which led to this change, particularly the anteriorly placed large eyes, the development of the frontal lobe of the brain, and the reduction of olfactory activity in favour of the dominant visual sense. He then demonstrated the nasal cavity of *Tarsius*, which exhibited a truly primate type of nasal fossa: he also indicated how man alone among the primates had developed numerous ethmoidal sinuses as compared with the two or three in the gorilla and orang. This demonstration was an excellent example of the use of the scalpel in settling problems of classification on the basis of morphology.

Dr. F. M. P. Eckstein (Birmingham) described age changes in dentition in the rhesus monkey, with special reference to the colony which he had been developing at Birmingham. The milk dentition of twenty teeth was usually complete in six months and the permanent dentition at seven years. The adult eruption of both sets of teeth was analysed in terms of sex and body weight, and, as in man, eruption in the lower jaw was usually earlier than in the upper. As in the primates generally with the exception of man, the second permanent molar erupted before the second premolar, and the canine, with its marked sex differences, erupted late. Dr. Eckstein provided a statistical analysis of the times of eruption and indicated the range of variation. Although his observations were based on a relatively small number of monkeys, yet the thoroughness of the work should serve as a model for other breeders.

Dr. D. V. Davies (Cambridge) discussed the cardiovascular system of the primates and made a plea for the provision of more primate material for dissection. He mentioned the variations in the great vessels arising from the arch of the aorta, the differences in the cerebral and cranial arteries, and the effect of enlargement of the hind limb and buttock on the branches of the iliac and femoral arteries. Finally he considered our inadequate knowledge of the detailed blood supply of the hand and foot, and pointed out that all primates except man had a saphenous artery accompanying the great saphenous vein.

In the discussion that followed, Professor Wood Jones spoke of the lack of accurate information on the development of the lower jaw, with special reference to the condylar cartilage and central mental foramen depicted radiographically by Professor Harris. Professor John Kirk (London) discussed the saphenous artery, and Professor Osman Hill answered some questions on placentation with particular reference to invasive tendencies in the chorion. Dr. J. Davies (Cambridge) made a plea for the supply of more embryological material with a view to settling many of the problems of the affinities of the primates. The placenta of the lemurs was of the simple appositional type, whereas in *Tarsius* the trophoblast had acquired invasive properties. These became more intense in the higher primates, and were associated with the tendency of the ovum to bury itself completely in the mucous membrane of the uterus. There were important associated differences in the formation of other structures, such as the amnion and yolk sac. The amnion in lemurs and *Tarsius* was formed by the method of folding, and for a time the ectoderm of the embryo was exposed on the surface. In higher primates such a method became impossible owing to the precocious development of the trophoblast. Both the amnion and the yolk sac were formed, therefore, by cavitation. The body stalk was also precociously formed, and the establishment of its homology with the allantoic stalk of the lemurs and lower mammals was a major achievement in embryology. The work of Streeter and Heuser on the development of the macaque embryo showed clearly that there were striking similarities between them and the higher primates, including man. Much valuable information on primate affinities was to be expected in the future from similar investigations on a wide range of forms. The main difficulty was obtaining material.

The morning session was attended by a lively group of over fifty anthropologists and anatomists. In the afternoon there was much discussion over the demonstrations which filled one of the large laboratories. In addition to demonstrations staged by the contributors to the morning session there were several interesting exhibits by members of the staff of the Anatomy School. These included the development of the mesonephros, by Dr. J. Davies; the basal metopic suture in man and primates, by Dr. H. Butler; the repair of the placental site, by Dr. M. M. Bull; and the fate of the fibula in the sheep, by Mr. K. Balankura. Dr. W. L. H. Duckworth, the doyen of anatomists and anthropologists, was unable to be present on account of an indisposition, but the whole series of demonstrations was a tribute to his teaching and stimulus.

SECTION OF PHARMACOLOGY

Friday, July 2

Antihistamine Substances

With the president, Professor E. B. Verney (Cambridge), in the chair, Sir Henry Dale opened a discussion on antihistamine substances. He described how in 1909–10 Barger found histamine in ergot and Ackermann found it as a product of putrefaction. On examination it was shown to cause symptoms resembling those of anaphylaxis, but different in some respects. Histamine did not cause swelling of the liver and did not cause the blood to become incoagulable; these changes occurred in anaphylaxis, the change in the blood being due to the liberation of heparin. Both Abel and Lewis believed that the anaphylactic reaction was due to the release of histamine, and Lewis studied the reaction of the skin to injury and ascribed the changes to the liberation of H-substance, of which the central active agent was histamine. Cells which released histamine might themselves react to it, or the cells which reacted might be other cells. Thus dog's liver released histamine, which might then affect the bladder. In allergic skin rashes histamine was released in the epidermis, but the cells on which it acted were the capillary walls of the underlying vessels.

Sir Henry Dale suggested that when cells which liberated histamine themselves reacted the action should be called intrinsic, but when histamine acted on distant cells its action should be called extrinsic. Antihistamine substances might protect against extrinsic actions only and not against intrinsic

actions. He quoted Schild's demonstration that sensitized guinea-pig muscle, suspended in a bath, contracted in response to histamine; after exposure to a large dose it was unaffected by a further application of histamine. Nevertheless addition of the antigen caused contraction; thus the cell responded to intrinsic histamine but not to extrinsic histamine. Such a conception might explain why antihistamine substances were good for vasomotor rhinitis but not for spasmodic asthma.

Discussing the release of histamine, Sir Henry said that the blood had been regarded simply as a vector of histamine; it should be studied as a tissue which itself might liberate histamine from eosinophil and other cells. Finally he referred to the possibility that histamine had a normal physiological function, being released in small quantities to regulate the local blood supply, and to Rein's statement that carbon dioxide potentiated the action of histamine. Care should be taken that antihistamines should not be used so as to interfere with this function.

Professor J. H. Gaddum (Edinburgh) said that the antihistamine substances were discovered in Paris largely by the work of Daniel Bovet, at a time when he was looking for antiadrenaline substances. Co-operation between pharmacologists and chemists had resulted finally in the introduction in 1944 of "neoantergan" ("anthisan"). In spite of the more recent introduction of other antihistamine substances, anthisan remained the best pharmacological tool, since it was more specific against histamine and less active against acetylcholine. Clinically the extreme specificity of anthisan against histamine might not be so important. Professor Gaddum described methods of testing antihistamine compounds, and pointed out that they reduced all histamine effects except its action on gastric juice. They had in addition local anaesthetic properties and a quinidine-like action on the heart.

Dr. R. B. Hunter (Edinburgh) discussed the clinical uses of antihistamine substances. He emphasized the need for comparative antihistamine studies in man before a new substance was introduced for clinical use. These could be carried out on the skin or related to the effects of intravenous histamine. For example, the incidence of toxic effects with R.P. 3277 was much greater than with anthisan. The beneficial action was best seen in urticaria. There was a diminution of the number of lesions within thirty minutes of the first dose. Dr. Hunter showed the effect of increasing the daily dose of anthisan from 0.4 to 0.6 g. daily, at which point the urticaria was fully suppressed. In the course of treatment the daily requirement might diminish—for example, from 0.7 to 0.2 g. It was not wise to stop treatment suddenly, or there might be a rebound effect. There was some evidence that "benadryl" was better than anthisan for the relief of itching. Antihistamine substances had little effect on established lesions, and when there was oedema of the tongue or glottis adrenaline was still required. When desensitization was necessary it should still be carried out. In severe cases of hay-fever desensitization followed by the use of antihistamine drugs during the season had produced complete relief in 95% of cases. In perennial rhinitis some relief was given by dummy tablets to 34% of a group of patients, but 50% obtained complete relief by taking anthisan, a relief which was accompanied by the reversion of the allergic nasal mucosa to normal.

Dr. R. P. Warin (Leeds) said that the side effects of R.P. 3277 passed off before the antihistamine effects. This substance had therefore been given in urticaria in one dose at night. Side effects had not been seen the next day and the urticaria had been controlled. Observations made on 20 patients for six to nine months had shown that tolerance to antihistamine substances did not occur so far as could be seen from the size of histamine weals in the skin.

Dr. J. Shlosberg (Salford) and Dr. H. G. J. Herxheimer (London) thought that antihistamine substances diminished the severity of asthmatic attacks in some cases. Dr. W. Feldberg (Cambridge) said that the fact that antihistamine substances did not affect the gastric secretion might be related to the connexion between histamine action and carbon dioxide. If an animal was overventilated it was impossible to produce gastric secretion with histamine. Dr. W. N. Leak (Winsford) said that the possibility of reducing the dose during treatment suggested that these antihistamine substances might lessen the formation of histamine as well as antagonize it. He mentioned the case of a farmer who suffered from severe asthma for twenty years and recovered after the removal of a perforated appendix.

Dr. Hunter, replying to some discussion of the relief of itching, said that the local analgesic action of antihistamines was short, while their effect on itching lasted for hours.

Antidiuretic Hormone

With Professor A. C. Frazer (Birmingham) in the chair, Professor E. B. Verney opened a discussion on agents influencing the functions of the pars nervosa of the pituitary. He described the diuresis produced in a dog by giving water by mouth and the inhibition of the diuresis by a sensory stimulus. With O'Connor he had shown that this inhibition was due to the liberation of antidiuretic hormone from the pars nervosa. The pars nervosa received impulses from nerve cells in the supraoptic nucleus, and it was presumably through this nucleus that the sensory stimulus caused a discharge of antidiuretic hormone. Professor Verney said that the normal function of this mechanism was to keep the osmotic pressure of the plasma as nearly constant as possible. If an injection of hypertonic sodium chloride was made into the carotid artery of the dog, then an inhibition of diuresis occurred and the greater part of this inhibition disappeared after removal of the posterior lobe. The response to sodium chloride was determined by the change in osmotic pressure, and the term "osmoreceptors" had been introduced as a name for the receptor elements, which were somewhere in the vascular bed of the internal carotid artery. The results of long-period intracarotid infusions showed that the osmoreceptors were freely permeable to and not affected by urea, less freely permeable to dextrose, and relatively impermeable to sodium chloride and sucrose. The local increase in osmotic pressure required in a forty-minute infusion on one side to reduce the urine flow during water diuresis to about 10% of its maximum was about 1.8% only. Water diuresis was aptly described as a condition of physiological diabetes insipidus, the antidiuretic secretion of the neurohypophysis being a hormone in the sense that its liberation was governed by the concentration of osmotically active substances, like sodium chloride, in the plasma.

Dr. Mary Pickford (Edinburgh) described experiments in which the injection of acetylcholine into a dog during water diuresis caused inhibition of the diuresis. These experiments were performed when the dog was fully atropinized. The inhibition was not seen when the posterior lobe was removed. It had been possible to demonstrate that the site of action of the acetylcholine was the supraoptic nucleus. This was accomplished by making the injection directly into the nucleus. It was found that a very small amount of acetylcholine caused inhibition provided that it was injected into the nucleus, but not outside it. The precise point of injection was determined by mixing Indian ink with the acetylcholine solution. By the injection of D.F.P., the potent anticholinesterase, into the nucleus, a state of complete anuria had been produced followed by a period of polyuria and thirst for two to three days. Thus a temporary diabetes insipidus had been created.

Professor J. H. Burn (Oxford) said that the effect of acetylcholine on the supraoptic nucleus must be a nicotine-like action, since it occurred in the atropinized animal. They had therefore tested nicotine in the rat and had found that it produced inhibition of a water diuresis, an inhibition which was not seen in the rat after hypophysectomy. Next they had observed that inhaling the smoke of one or two cigarettes exerted an antidiuretic effect in man, and that a similar effect was produced by the intravenous injection of the amount of nicotine inhaled in smoking one or two cigarettes. They had found that the inhibition produced was similar to that caused by 50–100 milliunits of posterior lobe extract. This corresponded to 10–20 milli-units per litre of blood. Further experiments by Dr. E. Bülbring and Dr. J. M. Walker had demonstrated that the intravenous infusion of nicotine into an anaesthetized dog led to coronary constriction. In observations on the heart-lung preparation of the dog they had found that the amounts of posterior lobe extract which when added to the venous reservoir were just sufficient to cause coronary constriction were 10–20 milli-units per litre, a concentration of the same order as that produced in the blood by smoking. Hence the evidence indicated that smoking might cause coronary constriction.

Dr. W. J. O'Connor (Cambridge) described experiments in which salt was given to dogs before and after diabetes insipidus was produced by section of tracts from the supraoptic nucleus. He said that the absence of the antidiuretic hormone did not influence chloride excretion, but the neurohypophysis determined the concentration of chloride in the urine, enabling the body to retain water during the excretion of salt. His evidence showed that only a small fraction of the maximal capacity of the neurohypophysis was required to control the full range of kidney function.

Dr. G. W. Theobald (Bradford) said that, since very minute amounts (0.005–0.01 unit) of post-pituitary extract inhibited water diuresis in man, it seemed logical to assume that amounts of the oxytocic hormone of the same order would stimulate uterine contractions. In Bradford it had been found possible to induce labour subsequent to rupture of the membranes and to augment the force of contractions in uterine inertia by means of a 1 in 10,000 solution of pituitrin given intravenously at a rate of 1 ml. per minute.

Dr. W. Feldberg (Cambridge) said that he had obtained additional evidence for the suggestion that the nerve fibres inpinging on the supraoptic nucleus acted by releasing acetylcholine, since the brain in this region had a high capacity for acetylcholine synthesis.

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knights: Brigadier Sir W. S. Duke-Elder, K.C.V.O., M.D., F.R.C.S., and Dr. Christopher Armstrong. *As Commanders (Brothers):* Lieutenant-Colonel W. S. Copeman, O.B.E., M.D., F.R.C.P., and Surgeon Rear-Admirals Sir H. E. Y. White, K.C.V.O., O.B.E., M.D., F.R.C.S., K.H.S., and C. E. Greeson, C.B., M.D., K.H.P. *As Associate Commanders (Brothers):* Major-General A. N. Sharma, I.M.S., and Drs. K. B. A. Hamid, M.B.E., and P. C. Roy. *As Officers (Brothers):* Surgeon Captains W. Colborne, F.R.C.S., and F. G. Hunt, C.B.E., M.B., R.N., Prof. P. Farrugia, M.D., Messrs. F. W. Law, F.R.C.S., and N. G. W. Davidson, O.B.E., F.R.C.S., Drs. C. Hibbert, J. D. Ingram, R. G. Selby, E. K. Macdonald, O.B.E., J. L. Johnston, H. Scholefield, J. A. Davies, J. P. J. Jenkins, O.B.E., T.D., G. W. H. Townsend, T. Hampson, *M.C.*, and R. Paton. *As Associate Officers (Brothers):* Lieutenant-Colonels D. P. Nath, M.B., and G. D. Malhoutra, O.B.E., M.B., I.M.S., and Captain K. B. N. J. Vazifdar, M.B.E. *As Associate Officer (Sister):* Dr. Chit Tin. *As Serving Brothers:* Surgeon Commander C. N. H. Joynt, M.B., and Surgeon Lieutenant-Commander W. S. Miller, M.B., R.N., Messrs. R. M. Hill, M.D., F.R.C.S., and R. E. M. Pilcher, F.R.C.S., Drs. P. N. Grinling, E. F. Brown, J. G. Billington, K. A. Boughton-Thomas, R. Rodger, J. S. Laurie, J. G. F. Hosken, J. Pereira, N. R. H. Holmes, W. W. J. Lawson, A. Macinnes, H. I. Marriner, J. V. Tollington, Thomas Jones, F. J. Rees, and J. F. Scales. *As Associate Serving Brothers:* Drs. A. Nath, J. Shibko, and V. Aye Pe. *As Serving Sisters:* Drs. Annette G. T. Anderson, Marian Maxwell Reekie, Marjorie C. Chappel, and Sylvia M. T. John.

Nova et Vetera

AN EARLY WORK ON MEDICAL JURISPRUDENCE

I have come across an interesting book, published in 1815, the title of which is *Elements of Medical Jurisprudence; or, A succinct and compendious description of such tokens in the human body as are required to determine the Judgment of a Coroner and Courts of Law in cases of Divorce, Rape, Murder, etc.; to which are added directions for preserving the Public Health.* It is by Samuel Farr, M.D., and includes an essay by Dr. William Hunter on observations on the uncertainty of the signs of murder in the case of bastard children. The first edition was printed in 1787, and it is claimed to be the earliest work published in England on medical jurisprudence. The book is a small one; the eight chapters on medico-legal matters, the chapter on public health, and Dr. Hunter's essay occupy together less than 200 small octavo pages.

The eight chapters on medical jurisprudence deal with pregnancy, parturition, divorce, rape, murder of infants, homicide, insanity, and malingering. The chapter on public health is particularly interesting, for it was written over 50 years before the first Public Health Act of 1848, the centenary of which is being celebrated this year. It is there suggested that magistrates should consult physicians of the first eminence with the idea of vesting powers in proper authorities for a general public health service—an excellent vision of things to come. Three general principles are laid down: (1) to prevent everything which may injure public health; (2) to see that sick people are properly treated; (3) to prevent the spread of infectious disease. These are three excellent propositions.

Under heading (1) fresh air, pure water-supply, and fresh and wholesome food are advocated. Unqualified practice is severely disapproved. Farr's observations on quacks are worth quoting: "No one can tell how much they injure society by violent medicines, the effects of which they do not see. They may introduce some fatal disease; and by inefficacious ones they prevent the effects of those which are proper. Many years ago a tax was laid upon quack medicines in England, which, it was presumed, would rather tend to suppress the sale of such articles; the contrary, however, has been found to be the effect: for every quack now professes that his medicine has the sanction of Government, and thus is the public the more easily deluded."

Under heading (2) he advises the provision of more hospitals and the better training of medical men; and under heading (3) the segregation of the infectious, the institution of quarantine, and the destruction of infected clothing are among the measures advocated. There are a few suggestions which will appear quaint to us to-day. "Chewing-tobacco and other herbs . . . should be used. Flowers . . . should be introduced in sick-rooms." The introduction of flowers and herbs, especially in Law Courts where gaol distemper prevails, are among the suggestions made. It is still a custom to present the presiding judge at many of our courts with a bouquet—a remnant of the old measure for protection from infection.

Remarkably foreseeing as these proposed measures were, it is strange that the whole subject of public health in 1815 could be contained in seventeen small pages of a book.

The chapters on medical jurisprudence on the whole contain few statements which could not be incorporated with accuracy in a textbook issued to-day. But there are a few assertions made which would not be considered as holding good to-day. For instance, under rape, I doubt if this extract can be accepted as correct: "But the consummation of a rape, by which is meant a compleat, full, and entire coition, which is made without any consent or permission of the woman, seems to be impossible, unless some very extraordinary circumstances occur." Again, it is stated that if absolute rape is perpetrated, pregnancy is unlikely. This is not in accordance with fact.

In speaking of abortion Farr makes the statement that there is no drug known which by itself will cause abortion. This is perfectly correct if one adds the words "without grave risk to the health or life of the mother."

The book concludes with a chapter by William Hunter on the uncertainty of the signs of murder in the case of bastard children. The distinguished author of this essay makes an eloquent plea for a more merciful treatment of women accused of infanticide of their illegitimate offspring, pointing out the necessity for much more careful and scientific examination of the dead child before deciding it has been killed and has not died naturally.

This little book, published first over 150 years ago, is remarkable in that almost all contained in it is in accordance with orthodox medical jurisprudence and public health to-day.

L. A. PARRY.

The British Council is arranging a programme for Lieut.-Gen. Kin Cheung, Dean of the Army Medical College, Shanghai, who is visiting Britain to see methods of undergraduate and postgraduate medical training in hospitals and universities, the medical organization of the British Army, and military medical training. He is also interested in elementary and secondary education. A graduate of the National Army Medical College, Peiping, and an M.D. of Berlin University, Lieut.-Gen. Kin Cheung was Surgeon General of the Chinese Army for several years during the war, and a member of a mission to the U.S.A. to study medical education and training in 1947–8. During his two and a half months' stay in Britain he will visit Cambridge, Oxford, Edinburgh, Glasgow, and Liverpool.

Correspondence

Status of the Academic Worker

SIR,—It is surprising that many medically qualified academic workers are not yet aware of the Full-Time Non-Professorial Medical Teachers, Laboratory or Research Workers Group of the British Medical Association. Short notices dealing with the proceedings of this group appear from time to time in the *Journal* and yet somehow fail to catch the eye of many of the Association's members working in laboratories.

It is particularly unfortunate that at this time of change and uncertainty so many should be unaware of the group that represents their interests. The need for such a body is overwhelming, especially for the more junior members at present occupying demonstratorships or equivalent posts. This class of worker, unless possessed of private means, seems to-day to be in an almost impossible position. After spending some three years taking a high-class honours degree in natural sciences (in common with general science students), followed in some cases by a year of preliminary research, he proceeds with the usual three years' hospital training and a year in house posts. Then on returning to the academic sphere he realizes that the medical degree he once thought to be only an advantage is in reality a mixed blessing. His colleagues, who are not medically qualified, have four years' seniority in teaching and research experience. After a further five to ten years' work he finds that he is, under present conditions, unable to provide a reasonable household for his family or to educate his children in the way he desires. His misfortune is that often his outlook precludes any active steps to alter his conditions of service or reward. Whilst the Inter-Departmental Committee puts forward recommendations dealing with the remuneration of practising consultants and specialists, and the N.H.S. (whatever its failings may be) deals with the remuneration of the general practitioner, the medically qualified academic worker is apparently forgotten.

Unless some change in conditions occurs it seems inevitable that this valuable member of the community will disappear. Present workers will probably be unwilling to change their mode of existence, but lack of replacement will lead to extinction of this branch of the profession. If an academic career is planned, a medical degree will be regarded as an unnecessary refinement. If a medical degree is obtained, the financial attractions of specialist or general practice will be too strong to resist. The medically qualified preclinical teacher will cease to exist. This is a very real and grave danger, and would seriously affect the standard of medical education in this country. At least a few medically qualified pathologists, physiologists, pharmacologists, biochemists, and anatomists are essential. The condition of survival of these teachers is largely dependent on their activities as a corporate body. For this reason I feel the lack of knowledge in academic circles concerning the existence of the only body of this kind—viz., the Full-Time Non-Professorial . . . Group—is to be greatly deplored.—I am, etc.,

Cambridge. GEOFFREY W. HARRIS.

Prevention of Venereal Disease

SIR,—The latest Report of the Ministry of Health (for the year ended March 31, 1946) has to acknowledge an alarming setback in venereal disease that has dismayed everyone who understands its significance. The Report of the Ministry says, "During the year 1945 the incidence of syphilis and gonorrhoea increased appreciably." This has happened after large sums of public money have been spent by the Government, through the Central Council for Health Education, in telling the public of the dangers of V.D., and in trying to conquer V.D. by fear and persuasion, coupled with treatment after the illness has developed. The public has not been allowed to learn the vitally important fact that a great deal of V.D. is easily prevented. This is a scientific fact and it has been known for forty years.

During the great wars the fighting services all over the world, owing mainly to the persistent efforts of this Society, were protected (more or less, according to the enthusiasm of the officer-in-charge) against these diseases by the preventive measures we have advocated for thirty years. But the civilian population all the time has been kept in ignorance, and so V.D. is on the increase.

The statement by the Government-appointed Trevethin Committee (1922) that "properly and promptly applied disinfection . . . would almost certainly prove effectual" has been ignored, and up to the present no Government has had the courage to translate these findings into action. It has been left to us, a voluntarily supported society, to work alone. And not only do we have to fight disease but very often violent prejudice as well.

Our policy is threefold : (1) to educate the public with regard to the fact that V.D. can be prevented by simple, scientific measures ; (2) to supply all interested persons with details of such measures ; (3) to secure the necessary alteration of the law to enable preventive materials to be sold together with instructions. This Society cordially supports any and every method whereby V.D. can be combated, but it is confident that V.D. will be eliminated only by practical prevention. Without practical prevention any campaign against V.D. is doomed to failure.

About 100,000 men and women sufferers from V.D. will be treated at clinics this year, and there will be a great number of infected persons who will not go to clinics. We are planning a great campaign to set the people free from V.D. and from the prejudiced tyranny that has kept them in ignorance of the facts. The scope and magnitude of this great attack depends upon the support we receive from the profession and from the general public. Let us show you how you can help.—I am, etc.,

HORDER,
President,
National Society for the Prevention of Venereal Disease.

47, Nottingham Place, London, W.1.

A Tribute to Former Officers of the L.C.C.

SIR,—As an addendum to Sir Allen Daley's wholly admirable article on "The Health and Municipal Hospital Services of London" (July 3, p. 19), I should be grateful if you would allow me to pay my humble tribute to the truly magnificent services rendered to the L.C.C. Hospital Service between 1930 and 1939 by the principal medical officers of those years, Dr. William Brander and Dr. H. W. Bruce (general hospitals), Dr. J. A.H. Brincker (special hospitals), and the late Miss Bannon, C.B.E., matron-in-chief. I should also like to add Dr. W. B. Knobel, who, working in close co-operation with the Supplies Department of the Council, was responsible for the building up and development of an extremely important section of the Hospital Service.

Not one of these ever received any public recognition of their great services to London : all the more reason therefore for their old chief to take this opportunity, when the L.C.C. Hospital Service has come to an end, of placing on record the great debt of gratitude due to them by all Londoners.—I am, etc.,

London, W.8. FREDERICK MENZIES.

Test of Death

SIR,—The alteration in the contour of the pupil on pressing with the finger over the ciliary region of the eye, as mentioned by Dr. G. P. Bletchley (June 26, p. 1257), depends on the intraocular pressure. In the normal eye this sign is present in life. It is more easily noticed in eyes with relatively low pressure, and is made use of by ophthalmic surgeons to provide evidence of the state of the intraocular pressure. It is less easy to detect if the pupil is small, but it is nevertheless present. If one eye is covered the pupil of the other dilates slightly, and the change of shape is more easily seen. As soon as the blood supply to the eye ceases, as in death, the intraocular pressure falls and the alteration in shape on pressure is then obvious and might be made use of as a "test of death," but it is hardly correct to state "that it is impossible to press the pupil out of its circular shape during life." It seems open to question whether such a test would be reliable in the kind of case in which a test of death is required.—I am, etc.,

Edinburgh. H. M. TRAQUAIR.

Voluntary Euthanasia

SIR,—Cardinal Griffin's outspoken condemnation of voluntary euthanasia at a service for delegates to the B.M.A. meeting at Cambridge held in the Roman Catholic church has received considerable notice in the Press. One of his grounds for condemnation was that "a doctor's duty is to save life and not to destroy it"; and "if it were recognized as part of his duty to inflict death he would rightly deserve to lose any confidence that the public had ever placed in him." (I quote from a report in the *Manchester Guardian*.) May I point out that doctors have many other duties besides saving life; also that under our Bill—the Voluntary Euthanasia Legalization Bill—introduced into the House of Lords by the late Lord Ponsonby, it is not proposed that any general practitioner should ever be called upon "as part of his duty" to administer voluntary euthanasia. On the other hand it is expressly laid down that only a doctor who has obtained a special licence for the purpose may do so.—I am, etc.,

Leicester. C. KILLICK MILLARD, Hon. Sec., Voluntary Euthanasia Legalization Society.

B.C.G. Vaccination

SIR,—In a recent letter Prof. G. S. Wilson (June 26, p. 1254) pleaded for "a properly controlled investigation into the value of B.C.G. vaccination under English conditions." I thoroughly agree with him and believe that this would be a most valuable piece of research.

But he also suggests that the B.C.G. should not be released for use in this country until this experiment, which he has estimated may take from five to ten years,[1] is concluded; though I made a similar suggestion myself in 1934[2] much has happened since then, and I do not now see on what grounds we can continue to be one of the few remaining countries in the world in which this vaccine is not obtainable.

Well over three million children have been vaccinated over the last 26 years, and it is now generally conceded that the vaccine is safe; moreover, at the recent Congrès International du B.C.G. in Paris, at which thirty-five countries were represented and over eighty papers read, no instance was reported in which the B.C.G. failed to produce immunity. As I have shown elsewhere,[3] B.C.G. vaccination can be added at little expense to our organization for fighting tuberculosis without in any way interfering with the existing scheme.

It has been pointed out that in this country there is a tendency to a decline in the incidence of tuberculosis without the use of B.C.G.; paradoxically this very decline is resulting in an increasing number of young adults leaving school and entering factories with a negative Mantoux. Need they, together with the children who are forced to remain in contact with tuberculosis through the present lack of institutional accommodation, await the result of the British experiment before receiving the benefit, however statistically unproven, of B.C.G. vaccination?—I am, etc.,

Henley-on-Thames. K. NEVILLE IRVINE.

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1 *British Medical Journal*, 1947, **2**, 855.
2 *The B.C.G. Vaccine*, 1934. Oxford University Press.
3 *Practitioner*, 1947, **159**, 50.

Prevention of Dust Diseases of the Lung

SIR,—After perusing recent articles on pneumoconiosis, anthracosis, and affections of the lungs due to the inhalation of dust and irritant particles (May 29, p. 1015; June 5, pp. 1065 and 1087), one is again lost in wonder that no mention is made of the simple and sure means of prevention and protection—that is the use of a small, light pad over the nose and mouth, as worn by nurses in the operating theatre, children's wards, etc. The pads, of course, are merely some six folds of butter muslin or gauze, with tapes to tie behind the head, and could be provided in unlimited quantities, to be discarded after use. Grit and dust particles cannot be inhaled through such a protection, and all workers under dusty conditions could be assured that no harmful results could possibly occur if so protected. The application to coal-miners is, of course, particularly significant at the present time.

By all means let us diminish or eliminate as much as possible the creation of dust and grit in trade processes, mining, etc., but surely real prevention of anthracosis, silicosis, or any form of pneumoconiosis can be obtained only by providing any exposed worker with a simple shield which will prevent any dust particles from ever gaining access to his respiratory system. The Director of the Pneumoconiosis Research Unit states that pneumoconiosis is a preventable disease and calls for imperative administrative action. How very right! But is it too much to hope that such action might be directed towards preventing the condition arising by the simple expedient suggested, rather than setting up a costly organization to deal with the crippling, and often fatal, after-effects?—I am, etc.,

Nottingham. LEONARD W. HEARN, Senior Tuberculosis Officer.

Gastric Herpes Zoster

SIR,—I read with interest the two cases of so-called gastric herpes zoster reported by Dr. R. V. Stone (May 8, p. 882) and by Dr. P. E. Fitzpatrick (June 19, p. 1206). However, I should like to point out that neither the epigastric parietes nor the stomach itself is innervated by fibres from T. 9 and 10. There is still no unanimity on abdominal topography, and I strongly advise the acceptance of the recommendations of Brown and Smith.[1] They advocate a modified Glisson's method of subdividing the abdomen. If this were used, then it is easy to map out the cutaneous innervation. The epigastrium is innervated by fibres from T. 5, 6, and 7, the umbilical region by fibres from T. 8, 9, and 10, and the hypogastrium by fibres from T. 11, 12, and L. 1. Brown and Smith have shown that the umbilicus is an unreliable landmark and should never be used as such.

Brown[2] has put forward the interesting theory that many organs (e.g., diaphragm, appendix, and testis) receive their nerve supply before migration, and that once innervation is established future migration makes no difference to localization of pain. I believe that this also applies to the whole of the alimentary canal. In this case the stomach develops well cranially,[3] probably opposite somites corresponding to T. 5, 6, and 7, small intestine opposite T. 8, 9, and 10, and large intestine opposite T. 11 and 12 and L. 1. One would expect pain from an ulcer at the lower end of the oesophagus to be "felt" in the distribution of T. 4. Clinical observation shows this to be the case—the patient always pointing to an area in the midline above the xiphisternal joint. Similarly pain from a gastric ulcer is felt high in the epigastrium and duodenal ulcer low in the epigastrium (corresponding to T. 5, 6, and 7). Small intestine pain is felt in the umbilical region (corresponding to T. 8, 9, and 10)—the appendix corresponds to T. 10, low in the umbilical region. Large intestine pain is felt in the hypogastrium (corresponding to T. 11 and 12, and L. 1).

It should be noted that the early pain is always felt in the midline—the early embryonic position. Accurately localized abdominal pain other than in the midline is always secondary to parietal peritoneum irritation—e.g., appendix pain in the right iliac fossa and gall-bladder pain at the 9th rib—and is much later in onset.—I am, etc.,

Dundee. K. MILNE.

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1 *Lancet*, 1945, **1**, 10.
2 Ibid., 1948, **1**, 386.
3 Arey, L. B., *Developmental Anatomy*, 1946. W. B. Saunders, London.

Pain in Childbirth

SIR,—The correspondence regarding pain in childbirth indicates that too little is known of the value for the emotional life of women of the experience of childbirth. My work for the Sheffield Marriage Guidance Council brings me in touch with cases where chronic unhappiness, constant ill-health, and marriage breakdown are clearly due in part to the wife's unsatisfactory sexual achievement. This is frequently associated with failure to achieve orgasm during intercourse, but this is in fact so common that the problem is not as simple as it may have appeared.

Woman's sexual satisfaction is not necessarily achieved only during intercourse, but also during the whole sequence—pregnancy, parturition, and lactation—which brings a development

that is not only biological but has the highest personal qualities. It is therefore not so much a question of the experience of pain only, but of the experience of a profound and severe sensation. The anaesthetized Kaffir buck which has been alluded to felt nothing at all and naturally found difficulty in understanding the situation. The human mother can be persuaded that the babe is indeed the one she has been bearing, but even then, unless labour has been long and difficult, she has at least a greater pleasure in being conscious and co-operative during what is after all a women's major creative activity—the creation of another life.

Dr. G. Dick Read's suggestion (June 26, p. 1256) that childbirth can be a wholly positive, responsible achievement should do much to redress the present tendency in some sections of the population to under-value the experiences of childbirth and therefore to overstress the experience—sometimes disappointing—of intercourse, and to postpone conception indefinitely. Naturally there is a widespread reaction from the ignorance and proliferation of past generations, and some couples find it wise to achieve a good married relationship before pregnancy, but women need to find a balance and a new integration between their erotic and maternal sexual activity and the wider emotional and intellectual life of which they are capable. The over-possessive mother, of whom we are so afraid, may be compensating by a distortion of mother-love for an inadequate experience, at the proper stages, of the sexual possibilities of marriage and motherhood. I know several cases where wives have more desire and a more successful relationship to their husbands after childbirth undertaken with Dr. G. Dick Read's routine. I would not decry wholesale the use of anaesthetics in labour, but the case has been made for a reconsideration of this question.

The abandonment of moral standards and the appalling breakdown rate of marriages, with the resulting effects upon the health and happiness of the community, might well be checked by a higher value being set on woman's contribution to society. Economically and intellectually she has rightly achieved a position equal or nearly so to that of man, but if her creative life lacks feminine development and expression, not only she but our society as a whole will suffer distortion and frustration. Hence any contribution to our understanding of the experience of childbirth will be a help not only to obstetricians and psychiatrists.—I am, etc.,

Sheffield. HELEN B. HERKLOTS.

SIR,—I should like to thank Dr. Grantly Dick Read for his letter (June 26, p. 1256). I believe Dr Read's approach to be the right one. Certainly his results are impressive and his technique should be investigated on an extensive scale.

In spite of the frighful scandals revealed in the 1937 maternity mortality report, this country still steadfastly refuses to give our mothers proper attention. No serious attempt whatever is being made on a national scale to present motherhood to our girls as a wonderful experience and achievement. We are content that it shall remain a nightmare of horror for thousands of young women, and in this nightmare their spirit and their health is too often ruined.—I am, etc.,

New Barnet, Herts. J. E. ELAM.

Lower-segment Caesarean Section

SIR,—Mr. B. C. Murless has described in your columns (June 26, p. 1234) the ingenious instrument he has invented to help him in the extraction of the head from the lower uterine segment in caesarean section. When working without an assistant some such apparatus should prove exceedingly helpful. May I suggest to him the following manœuvre when an assistant is available?

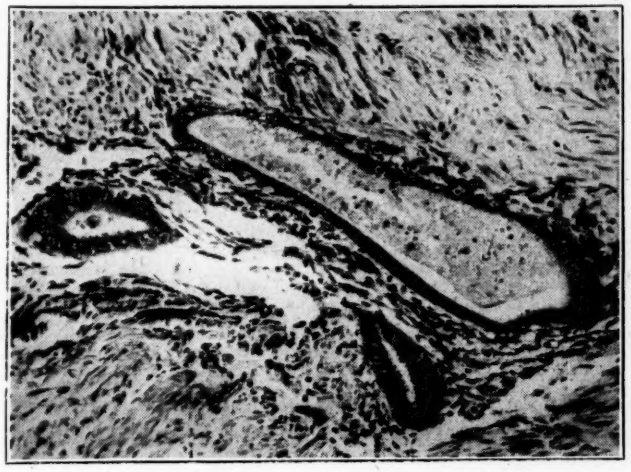
After the abdomen has been opened and the self-retaining retractor inserted, the operator puts both hands into the pelvis and elevates the head. His hands are then replaced by the assistant's left hand, which with the tips of the fingers (and with the wrist strongly dorsiflexed) keeps the head in the elevated position. The surgeon now incises the peritoneum in the line of the utero-vesical fold, sponges it down together with the bladder, and then cuts down on the head until the membranes are reached. These are picked up and cut with the scissors. The head immediately begins to present at the opening, and with a snick of the scissors in an upward direction at either end of the wound sufficient room is available for the delivery of the head. While the incision is being made into the uterus the anaesthetist injects 1 mg. of ergometrine intravenously—I have entirely given up the use of "pitocin" for this purpose—and with the head directed into the wound the uterus does the rest.

The only occasion on which any awkwardness may arise is when the assistant has an insufficiently supple wrist, but after a little practice a sufficient dexterity is quickly acquired.—I am, etc.,

Torquay. B. VENN DUNN.

Aberrant Endometrial Tissue and Intussusception

SIR,—Dr. E. M. Southern (June 19, p. 1178) reports my case of irreducible intussusception at the apex of which was found endometrial tissue. He concludes that the chronic intussusception probably gave rise to the stimulus which caused serosal metaplasia. I submit that the ectopic endometrial tissue caused the intussusception. Since the menarche at 14 years this patient, now 23, had vomited on the first day of each period, which necessitated her spending this day in bed. Since I resected the affected portion of the intestine she has had normal periods, free from vomiting. The history of recurrent attacks of intussuception was only three months. Part of the section (I enclose a photomicrograph) shows blood in the



endometrial tubules. My view is that her vomiting and pain on the first day of each period were due to this menstruation into the ileum. During the three months before operation this had caused sufficient swelling to form the apex of an intussusception, at first spontaneously reducible, finally irreducible. The fact that she no longer has dysmenorrhoea implies that all ectopic endometrial tissue has been removed.—I am, etc.,

London, N.19. G. C. DORLING.

Medical Photography

SIR,—Having previously written to the *Journal* on the above subject, I was interested in the letter by Dr. J. H. Twiston Davies (May 22, p. 1001). In the *Journal* of Oct. 20, 1945 (p. 548), Dr. S. Watson Smith wrote advocating the photographer–physician combination, and I agreed with him and gave some technical details of colour photography in the issue of Nov. 17, 1945 (p. 704), and also on the taking of colour photomicrographs with an ordinary camera in the *Journal* of Jan. 29, 1944 (p. 164).

During the past 22 years, as a dermatologist I have done a good amount of clinical photography in this special branch. For the last nine years I have been converted to colour photography in particular, as it is undoubtedly the best medium on which to record skin cases. I know there are some snags and difficulties with colour work, but difficulties are made to be overcome, and when one remembers the early efforts at *x*-ray photography and compares them with the present products of that branch of medical photographic art, even on the 35 mm. mass radiography films now fairly popular, one must realize

that things have improved. I know that some dermatologists who have not been successful with colour photography say they would rather have a good black-and-white picture, but then the real answer should be that they ought not to have taken a bad colour one.

One of the present-day troubles of acting as photographer-physician is that it is very difficult in these days of hard drudgery and work in dermatological out-patient departments (where often most of our best pictorial provender is provided) to find time to take any photographs. Hence, much as I dislike it, I have tried at different times to get a professional photographer to take photographs of a case for me. The result has always been most disappointing or a complete failure, even though the photographer has been a most highly qualified technical person. In my experience professional photographers are often somewhat fussy and pedantic, and more inclined to think of a studio portrait or picture than a clinical one. The latter may be taken solely to bring out some particular point—e.g., the burrow or acarus in scabies on the foot of an infant.

"Hospital photography departments are often an absurdity," as Dr. Twiston Davies states. Furthermore, the so-called clinical camera is often an antique abomination and an anachronism totally unsuitable for its object. Usually it is a bulky half-plate affair with a small aperture, poorish quality lens capable of only some prolonged exposures, and unable to reproduce true details in anything like reasonable time. Its bulkiness does not permit rapid change of position when taking a quickly moving object, and one would find it impossible to take such an object as an unruly child with eczema of the face, etc. It cannot conveniently be used anywhere in the hospital owing to its size, and is not suitable for use either at the bedside or in the out-patient department.

Having been somewhat destructive in my criticism, let me now offer some constructive ideas. For good clinical work I think a camera made on the combination of the ideas incorporated in either the "Leica" or "Contax" with the "Reflex Korelle" and provided with a good-quality lens capable of doing clinical work with an F 3.5 aperture would be valuable. It should be capable of taking a good detailed picture in artificial light using F 3.5 aperture at not more than one-thirtieth of a second. If made on the above principle it should not be bulky or heavy in weight, and could readily be held in the hands if necessary for bedside work and also for taking photomicrographs in colour.

There are obvious advantages in using 35 mm. film for clinical work, including convenient size, cheapness, and the fact that it is possible to get all varieties of film in this size. In the U.S.A. it is possible to get copies and enlargements in colour from 35 mm. colour transparencies, and those I have seen are quite good, but owing to monetary difficulties in this country at present it is not feasible to get this done here. Perhaps later on it may be done, and in any case it is an accomplished fact.

With regard to a properly equipped photographic department in a hospital, there is always a certain amount of routine work that could be effectively carried out there, such as the taking of pictures of pathological post-mortem specimens, photomicrographs of sections, copying, enlarging, and reducing prints and negatives, developing and printing, etc.

The other day, when I was at a certain hospital, I was told the committee had sanctioned the purchase of photographic equipment up to £200 in all, and they thought this was an enormous sum for the purpose. I can assure them that this is not so. It might buy the very minimum required on the second-hand market to start with, but no more.—I am, etc.,

Leicester. F. A. E. SILCOCK.

SIR,—The criticism of my remarks by Mr. William Gissane (July 3, p. 53) in no way alters my opinion, for from long experience, but on much more modest lines, I found that medical photography tended to useless extravagance, particularly when the enthusiast did not bear the cost. As we are told that some 5,000 prints "are confined to less than 2% of the patients we treat," are we to assume that the rate of progression indicated by the figures quoted will continue with expansion of the department until 100% are photographed? I cannot help but think that research workers would benefit by memorizing Hamlet's advice to the players. Even if all the "hoped for" results could be so achieved, it would be well at this time, before launching out into expansions of ancillary services, to remember that we have run through the American loan of £937,000,000 in 18 months, and further loans threaten seriously to lower the already very low standard of living.

Nothing would have pleased me more than to have received the co-operation which would have permitted me to feel that I had earned the credit Mr. Gissane so generously bestowed. No one knows the practice in modern fracture practice better than he, but I have repeatedly warned clinicians of the folly of taking unnecessary risks, which they do by purposely avoiding rather than seeking the co-operation of radiologists. It is regarded as negligence in the courts if the doctor has failed to have *x*-rays taken in cases of possible bone and joint injury, but it should be realized that an equally serious charge may be sustained if it is proved that the radiography was insufficient or showed evidence, readily recognized by the expert, which had been overlooked. It would not help matters to urge that the hospital had available a competent radiologist.—I am, etc.,

Edgbaston, Birmingham. JAMES F. BRAILSFORD.

Surgery of the Heart

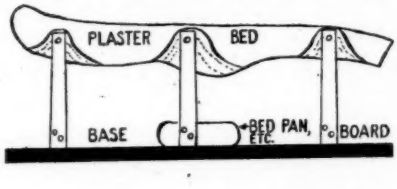
SIR,—Everyone must be greatly interested in the newest approach to the surgery of the heart as detailed by Mr. R. C. Brock (June 12, p. 1121). His achievement at once reminds me of the foresight and vision of the late Sir Lauder Brunton (died 1916), who in 1902 wrote a "Preliminary note on the possibility of treating Mitral Stenosis by Surgical Methods" (*Lancet*, 1902, **1**, 352).

It was some years afterwards I heard that physician speak on the idea of its possibilities. Had he been with us to-day he would indeed have been fascinated and glad to know that some surgeons have come so near to attaining what he envisaged.—I am, etc.,

Maidenhead. G. GREY TURNER.

Slinging Plaster Beds

SIR,—I am enclosing details of an extremely simple and very efficient method of slinging plaster beds, etc. It lends itself to a variety of uses and simplifies the nursing problems. It is cheap and the parts can be used again. Also an infinite variety of cross-bracing and strengthening is possible, even after the patient is in occupation of the cast.—I am, etc.,



Uprights are 10 in. × 12 in. domestic shelf brackets obtainable at any ironmonger's.

London, N.W.4 ROBERT HUNT COOKE.

Suggested Substitute for Talc

SIR,—I have read with interest the three papers and your annotation (June 5, pp. 1077, 1078, 1079, and 1090) on siliceous granuloma produced by talc when used as a dusting powder for rubber gloves in surgical operations. May I suggest that a suitable substitute for talc might be light basic magnesium carbonate in which the particles have been coated with magnesium stearate? The fatty acid content of the magnesium carbonate is about 4%. By this means the physical characteristics of talc are largly reproduced—i.e., soapiness and slip. The apparent density is much lower than that of talc, and therefore a smaller weight is required for dusting a given surface.

I do not think the magnesium carbonate would have any undesirable effect should any accidentally get into the wound, but I am not sure about the small quantity of stearate. Alternatively, plain light magnesium carbonate might be sufficient for the purpose. Both these products are used in the rubber industry as dusting powders and are readily available.—I am, etc.,

Washington Chemical Co., Ltd., Washington, Co. Durham. J. S. F. GARD.

Acute Deficiency Diseases

SIR,—In the pamphlet issued by the Nutrition Subcommittee of the Colonial Medical Research Committee on the treatment of acute deficiency diseases, referred to in a recent issue (June 26, p. 1247), there appear to be some important omissions.

1. Nutritional oedema is not mentioned, yet experiences recorded by medical officers who were P.O.W.s in the Far East show that not only was this more common there than wet beri-beri but had been frequently mistaken for that condition.

2. Besides Wernicke's encephalopathy due to vitamin B_1 deficiency there is the pellagra encephalopathic syndrome described by Jolliffe and others which does not respond to vitamin B_1 but to high doses of nicotinic acid.

3. No mention is made of central cord syndromes, which may or may not be associated with nutritional retrobulbar neuritis. Incidentally, may one call attention here to the morbid histology of these conditions illustrated by H. H. Scott in his fatal cases of central neuritis (*Ann. trop. Med. Parasit.*, 1918, 12, 109)?

An impression remains also that some of these deficiency states have been rather over-simplified, for in spite of our advances in knowledge some of the causes are still largely unknown, even if others can be excluded.—I am, etc.,

Cheltenham. D. FITZGERALD MOORE.

Inquests and the Press

SIR,—Were it not a tragic sign of the times, it would be comic to see the British Medical Association becoming permeated with the most pernicious of all socialist ideas—that man must be guided, directed, bullied, exhorted, and, above all, protected from the hard world.

I refer to the proposal to seek a limitation on the reporting of suicide cases on the grounds that others are tempted to do likewise, and I write not as a journalist wishing to report all the details for the sake of a "story," but in defence of the right of the responsible citizen to a newspaper which mirrors life in full, and not just so much of it as his legislators and their officials, and it now seems his medical advisers, think is good for him.

Surely it is their preoccupation with mental illness that has made these members of such a body as the B.M.A. subscribe to the current doctrine that the world must be made safe for the weak-headed. Must they not on reflection realize that the responsibility of the individual is the foundation on which rests the survival of mankind?—I am, etc.,

Sheffield Telegraph. TUDOR I. THOMAS, Chief Sub-editor.

"Young" Doctors

SIR,—I and my contemporaries have to thank you for publishing Dr. Hopkins's pathetically true letter (June 26, p. 1258). What he complains of, in brief, is the premium of protracted penuriousness that continues to be placed on academic and clinical self-improvement, the result of the scandalous wages paid for "superior" appointments. The persistence of such a state of affairs is obviously the economic result of blind, thoughtless competition of the fierce present-day type. The shameful, unexaggerated truth of Dr. Hopkins's statements is not in doubt from any quarter. If we, his fellow-sufferers, cannot unite in drawing the forceful, fecund attention of the profession and the public to this matter, we have only ourselves to blame.—I am, etc.,

London, N.W.3. A. GUEDATARIAN.

The Homosexual in the Courts

SIR,—The letter from Dr. Eric Coplans (July 3, p. 53) properly draws attention to a state of affairs which many of us regard as urgently needing full and frank discussion between doctor and lawyer. The situation such as Dr. Coplans describes is no doubt distressing. I would submit that the situation of the homosexual who seeks advice on account of his homosexuality, and recognizes that not only is he not as others but that a way of life which is to him desirable is barred to him, is in an even worse position. Such people suffer from a distress of mind which is profound, and yet may in no way be aggravated by any threat of punishment.

Study of these cases over a number of years leads me to suppose that there are certainly a variety of groups, including those in whom the activity is prosecuted in a manner suggesting depravity, those in whom the innate deviation has been successfully controlled until some additional factor breaks down that control, those in whom the innate deviation is recognized and deplored, and finally those in whom the innate deviation is present but not recognized or at a conscious level.

There can be few of us who would not agree that assaults, whether heterosexual or homosexual, upon children should be punishable; but whether it should now be recognized that in homosexual as in heterosexual "assaults" an "age of consent" should obtain is a matter surely for careful debate. The law has been accused of lagging behind public opinion, but recent events in both Houses have surely shown that careful study of medico-legal questions from all angles is necessary before any change in the existing penal code be considered.—I am, etc.,

Taunton, Somerset. R. SESSIONS HODGE.

Biography of Sir Bernard Spilsbury

SIR,—I am collecting material for a biography of my father, the late Sir Bernard Spilsbury, and would be most grateful to anyone who can supply any information which would be helpful. Any documents or photographs will be copied and returned immediately.—I am, etc.,

8, Eton Hall, Eton College Road, London, N.W.3. EVELYN STEELE.

A Medical Reply to the Minister

SIR,—The Minister (July 3, p. 1) sends a pleasant message to the profession on the eve of inaugurating the new Service. He lives on a plane remote from the hard and cruel facts of human suffering. His views are provocative.

When during the past year the Minister and profession have been joined in battle, for him to say that the Act "has not had an altogether trouble-free gestation" is a travesty of truth. Nor is the money factor irrelevant to the doctor–patient relationship, though the manner of its transfer may need adjustment.

He recognizes the stigma of "panel doctoring," but his Act offers to extend this degraded standard of practice to the whole nation. The conditions of the panel which prevent good work are aggravated by his legislation. Doctors are already overworked and will be no more numerous but their surgeries more crowded. The undertaking is novel in taxing *all* classes, but there will still be "two-grade service under the Act," because, like the Minister, many citizens disapprove of panel doctoring and, where able, will pay extra to obtain the advantages of a private doctor. This is as regrettable as it is inevitable. Sir Lionel Whitby cheers us by his erudite address following the Minister's message in the *B.M.J.* by impressive figures on the cost of elaborate modern medical services, prohibitive for the individual but now to be borne by the State; this is tantalizing, as the benefits are not there to be paid for but merely a place on ignominious waiting lists. He quotes interesting historical precedents for State control of medicine, but omits mention of the disappointment that has followed recent efforts in other countries.

The profession in the last decade expressed its whole-hearted desire for a comprehensive national service, but between that great conception and the creation thereof we know by our knowledge and experience of health problems that a lengthy pregnancy must intervene. Had we been consulted in planning reformation the nation would have been spared the disgrace of last week's abortion. An "ambitious adventure" need not be precipitate. Some prominent doctors claim that the B.M.A. has in recent weeks gained "a victory," but this is a misnomer for removing a few ugly excrescences off a sham castle.

Let us go forward undaunted with the Minister to build a national health service, but it must be founded on truth and proceed by stages.—I am, etc.,

Bristol. A. WILFRID ADAMS.

Safeguards in Service

SIR,—As a member of the B.M.A. who has been compelled, like many others, to join the National Health Service under economic pressure, I would like to ask our leaders the following questions :

1. As we have now surrendered on all the points for which we fought, exactly what legal safeguards has the B.M.A. secured for the doctor entering the Service against unfair dismissal or victimization on ideological or other grounds, seeing that we have surrendered the right of appeal to law against the decisions of an arbitrary authority ? An Amending Act to prevent the institution of a salaried State service is obviously no sort of protection against injustice of this kind.

2. In the event of one of its members being the victim of injustice and tyranny of this sort, exactly what action would the Association be prepared to take on his behalf ?

3. Exactly what concessions (apart from the so-called Amending Act) has the B.M.A. secured for us from the Minister in return for the surrender of our fundamental rights as free men ?

4. What grounds has the B.M.A. for believing that, now we have surrendered completely, the politicians intend to carry out their obligations towards the profession in an honourable manner ? For example, what guarantee have we from the Minister that the proposed capitation fee will under no circumstances be ever reduced ?

5. What steps the leaders of the Association are taking to secure for our profession the same rights and privileges as those of other workers—i.e., the 48-hour week, holidays with pay, guaranteed full employment, and so on.

Would the leaders of the Association please issue a clear statement in answer to these questions ?—I am, etc.,

London, S.E.6. G. TAYLEUR STOCKINGS.

Film Propaganda and the N.H.S.

SIR,—Amidst the deluge of propaganda which the authorities deem necessary to herald the new Service, I wish to deplore the misrepresentation of medical practice and the general practitioner in the film features showing in the cinemas at present. The latest Ministry of Information effort shown in the local cinema suggests that the general practitioner is ineffectual and obsolescent—a purveyor of doubtful medicines, inadequate in the simplest diagnosis, quite ignorant of modern medicine, and, in fact, a menace to the sick. But after July 5 public toleration of this state of affairs will be relieved by the large army of specialists waiting to rectify his ignorance and treat the ills their misguided colleagues have left unrecognized for so long.

This is the content of a film shown to a vast section of the community, readily influenced by visual impressions, and which until recently had a certain loyalty to and faith in the family doctor. It seems an inopportune moment for an attempt on the integrity of general practice—that "backbone of the profession" we are so often reminded of—at a time when confidence is so badly needed in it. Can we afford to ignore the spirit of this indelicate publicity, or is it part of a campaign to relegate general practice to the level of that suggested in the film—condoned by whatever medical advice the producer necessarily enlisted ? This is yet another example of Ministerial publicity in keeping with the "widow of the roads" poster, and made so much worse by the irresponsibility of the members of the profession who so encourage such nonsense.—I am, etc.,

Rugeley, Staffs. S. DILLON.

Professional Secrecy

SIR,—In the debate in the Northern Ireland Parliament on June 23 on a motion to annul Health Service regulations, Mr. S. T. Irwin, F.R.C.S., M.P., said in relation to professional secrecy between doctor and patient, "In regard to records, I quite agree with the Minister that there has been a lot of rubbish talked about that point" ; and again, "I should see no objection whatsoever to any record, even a full record, with the patient's name, being sent to the Ministry if they so desire" (*N.I. Hansard*, Vol. 32, No. 36).

Mr. Irwin may have voiced the opinion of the consultants, though I do not think so, but he certainly did not voice the opinion of the G.P., nor, I think, that of the great majority of the public, and it is decidedly interesting to speculate that while these deplorable sentiments were in course of utterance Sir Ernest Graham-Little may have been writing the admirable letter published in your issue of June 26 (p. 1259) which so adequately refutes them.—I am, etc.,

Belfast. W. LYLE.

The Part-time Consultant

SIR,—Mr. G. Lowe and Dr. T. N. Rudd (July 3, p. 24) have produced a most interesting and excellent defence (if indeed one was needed) of the part-time consultant. I was a little disappointed to see no mention of what may well be regarded as the point on which this method of specializing is most open to criticism.

The part-time surgeon operating on one of his own cases becomes the sole executor of that patient's fate. Of course this might also be applied to almost every contact made by a G.P. with his patients, but operative work is on a different footing in that the risk of a patient's life being made or marred—or even lost—is rather more formidable. The full-time specialist sees the patient at the behest of the family doctor ; he decides to operate, and the G.P., seeing the outcome, is in a position to vet the surgeon's work. If he is not happy about it he calls someone else next time. The part-timer operating on his own cases has no one to call a halt, for anyone with experience of the handling of patients and their relatives knows them to be very bad judges of professional merit. As often as not the patients one has done most for are quite ungrateful, while an unexpected death may well be met with most glowing tributes from the relatives. Certainly one's professional standard could not be expected to rise to any great heights if such a capricious tribune—however much "at close quarters"—is accepted by the part-timer. I must confess that I can find no answer to this criticism, unless the part-time consultant refrains from providing specialist treatment for patients who have come to him primarily in his capacity as a G.P.—I am, etc.,

Redhill, Surrey. N. E. PITT.

Remuneration of Consultants

SIR,—Apart from the "prizes" suggestion no one will quarrel with the Spens Report on the remuneration of future consultants and specialists from their (consultant) infancy to their majority, but it appears that no recommendations have been made for present established consultants, nor is there any differentiation between the senior man, in charge of beds and responsible for a team (in accordance with modern concepts of specialization), and the junior members of that team, with less responsibility. I submit that present senior consultants should qualify *now* for the maximum salary and "prize" and that the basic salary be paid to the assistant surgeons in his team, and that some method other than the "prize" should be evolved gradually to increase the assistant surgeon's salary until he becomes senior. In this way the senior surgeon would have his experience, training, and controlling of his team suitably rewarded, and would receive approximately the same amount as the general practitioner who is undertaking the training of an assistant with the maximum list—e.g., general practitioner with assistant and list of 6,400 : £5,760 ; senior consultant : basic salary £2,500, plus maximum prize, £5,000.—I am, etc.,

Middlesbrough. D. C. DICKSON.

Remuneration of Teachers

SIR,—Your correspondent, Professor Samson Wright (July 3, p. 47), discusses the discrepancy between the salaries of specialists in the medical profession and of teachers of medical students. He is rightly concerned that low salaries should not drive able men away from teaching.

This issue has wider aspects than those already raised and they must be taken into account when the future of medical teaching is being considered. Professor Wright mentions specifically anatomists, physiologists, and biochemists ; he implies that their remuneration is inadequate. Many, probably most of them, are university teachers. But medical students in

the preclinical stage are also taught (and, we hope, influenced in the way Professor Wright desires) by chemists and physicists who are also university teachers. They, too, are recruited from "young idealists," and, if not subject to the temptations of the salaries offered by the National Health Scheme, they could readily command higher salaries outside teaching than those which they receive from the universities.

It would therefore hardly be possible to increase the remuneration of teachers in one science department of a university without doing so in all others. It will readily be seen that similarly there could be no differentiation between the science faculties and the arts faculties. Thus a consideration of the conditions of service in teaching departments of medical schools must ultimately lead to a consideration of the whole of university teaching. Many of us in the universities would welcome this. My immediate point, however, is to suggest that medical teaching cannot be considered apart from university teaching as a whole.—I am, etc.,

University College, Hull. J. J. KIPLING.

Remuneration of Research Workers

SIR,—Professor Samson Wright (July 3, p. 47) has drawn attention in a striking manner to the contrast between the present remuneration of teachers of the basic medical sciences and that proposed for consultants and specialists in the Spens Report. It cannot be denied that the consequences he foresees, if the conditions of service in teaching departments are not urgently reconsidered, are not unlikely to be fulfilled. I would like to point out that the contrast applies with equal force to whole-time medical research workers, whether they work in the universities or in research institutions, and more or less irrespective of their employers (except for a few industrial concerns). Medical research also may cease in the future to draw its share of the ablest medical graduates as it has in the past.

The contrast is of course not new, but there are two novel features in the present situation. The first is that the salaries proposed for consultants have been given wide publicity, and the disparity is now clear to many people rather than to a few only. The second is that the conditions of service under the National Health Service are likely to remove a number of factors, such as the worries of building up a practice and of collecting fees, which in the past have decided able persons in favour of a career in teaching or research rather than in consultant practice. These two reasons, apart from any considerations of proper rewards for service to the community, make a reconsideration of the position of medical teachers and research workers particularly urgent.

The problem does not end with medically qualified persons, however. The possession of a medical degree may well affect the position attained by a teacher or research worker in his line of work, but it does not affect the ability or value of scientists without medical qualifications who are already doing good work in these fields. They will have to be treated equally with their medical colleagues. How far beyond medicine the repercussions may extend is a matter requiring much clear thinking, and one to which the Association of Scientific Workers is giving considerable attention.—I am, etc.,

ROY INNES,
General Secretary,
London, W.1. Association of Scientific Workers.

Medical Records

SIR,—Now that most general practitioners are committed to practising under the new Health Act they will be supplied with large numbers of medical record envelopes, not only for actual patients needing treatment, but for all others who are not patients but have registered with them. In most cases these will amount to some thousands of bulky record cards, and I trust all necessary steps will be taken to induce the Ministry of Health to supply us with suitable cabinets to house these cards satisfactorily. Clerks in Government offices are not expected to supply filing-cabinets for the cards they work with, and there is no reason why an exception should be made in the case of the medical profession.—I am, etc.,

Slough, Bucks. H. TUDOR EDMUNDS.

Post Office Medical Officers and N.H.S.

SIR,—While one may sympathize with P.O.M.O.s in their loss of income consequent on the introduction of the N.H.S., the terms "anomaly" and "injustice" can hardly be applied to a part of the Act which extends the right of free choice of doctor to considerable numbers of the adult community who have hitherto been denied this privilege. On the contrary, many P.O. employees (and doctors) may feel that this is one of the few anomalies and injustices which the Act will remedy.

It would be a serious mistake for the B.M.A. to ask for a restoration of the *status quo* (and presumably that is the only action they could take in the matter), since any request that a certain section of the community be denied free choice of doctor could be interpreted as a move towards that type of service which permits "direction" of the patient and disallows the doctor his right of refusal.—I am, etc.,

Cookridge, Yorks. CLIFFORD T. ROBERTS.

Chemists' Working Hours

SIR,—Dr. M. Mundy (June 19, p. 1208) has given prominence to the fact that pharmacies are not open at a late hour to serve patients with urgent medicines, and he has stressed the efforts which he made to remedy this position when a member of the Middlesex Insurance Committee. On behalf of the committee of the Harrow Branch of the Pharmaceutical Society, which represents all sections of pharmacy in this area of Middlesex, I can assure Dr. Mundy that the problem which he discusses is of no real significance. Some of our members live over their pharmacies, others have informed the police when and where they are available should the need arise, but all of them rightly resent an extension of their working hours for no apparent purpose. In a few instances cases have come to our notice where so-called "urgent" prescriptions were issued two or three days previously, and an analysis of 151 prescriptions dispensed after closing hours over a period of 15 months showed only three forms which were marked "urgent" by the physician.—I am, etc.,

H. W. TOMSKI,
Hon. Secretary,
Pinner, Middlesex. Pharmaceutical Society (Harrow Branch).

POINTS FROM LETTERS

Pain in Childbirth

Dr. H. M. DENHOLM-YOUNG (Farningham, Kent) writes: Several young mothers have told me that at the moment of delivery they felt no pain or discomfort, but a physical sensation of ecstatic pleasure. We know that delivery often means the utmost agony and an anaesthetic must surely be at hand, but if a woman is experiencing pleasure and refuses anaesthesia at the last moment it can only be unconscious jealousy on our part if we insist on giving it. May it be that our tenacious belief in the agony of birth is a desire that the mother should pay for possessing a child? One notices frequent unintentional cruelty by doctors, nurses, and teachers towards mother and child, expressed in possessiveness, bossiness, sneering at mother love, and devious excuses to separate mother and child in hospital and in school. We should always be aware and wary of this in ourselves.

Staircases and Ceilings

Dr. RICHARD BELL (Haydon Bridge, Northumberland) writes: In modern times public health authorities have steadfastly directed that ceilings should be eight-and-a-half feet from the floor. The economic factor has always limited the size of rooms. From this it follows that staircases in modern houses are always too steep. This fact becomes more strongly impressed on one as middle age approaches.

There is absolutely no reason whatever why ceilings should not be lower and the floor space of rooms greater, if only one could break with the tyranny of custom. Then could the aged climb gently to their bedrooms.

Vaccination

Mr. W. K. FITCH (London, W.C.) writes: I was interested in Surgeon Commander Smith's warning (July 3, p. 54) that immunity to smallpox is not necessarily shown by the failure of vaccination "to take." One of my sons joined the Merchant Navy in 1942. His first voyage was to India, and at the first port of call he, another cadet, and several of the ship's officers were vaccinated. In no instance did it "take." According to the master of the ship it wasn't supposed to "take," for what did my son think would happen if everyone on board went sick with a sore arm! Needless to say, on his return to the U.K. he was immediately vaccinated, and there was no doubt that it "took."

Obituary

Dr. JAMES THOMAS MOORE GIFFEN died at his home near Chester on March 11 at the age of 84. Of Ulster stock, Dr. Giffen was born and brought up in Co. Antrim. He studied medicine at Glasgow University, and qualified in 1887. In 1892 he took the F.R.C.S.Ed. Immediately after qualifying he served as surgeon to the Cunard Line before settling in Chester, where he continued to practise until his retirement in 1924. During the first world war he acted as surgeon to the Red Cross Hospital at Hoole Bank, where he did much useful work. Apart from this his professional work was entirely in general practice. He was for many years one of the leading and most popular doctors in Chester, and his name is still revered and spoken of with affection by his old patients. An enthusiastic fisherman and keen naturalist, the earlier years of Dr. Giffen's long retirement were largely occupied in fishing and country rambles. Latterly, debarred from these occupations by advancing years and failing health, his time was mainly spent in serious reading. To the last he kept abreast of advances in medicine. From 1890 he was an active member of the British Medical Association, and in 1929–30 was chairman of the Chester Division. His honorary membership after fifty years was a source of much gratification to him. He was predeceased in 1946 by his wife, formerly Miss Bretherton, of Crabwall Hall, Chester. A devoted couple, they left no family.

Dr. THOMAS ADRIAN GREENE, one of the leaders of Irish psychiatry during the first forty years of this century, died at his home at Killyleagh, Co. Down, on June 26. Dr. Greene, who came of landed stock in the west of Ireland, qualified in 1894, and first entered the mental hospital service as assistant medical officer to Ennis Mental Hospital. In 1909 he was promoted, at a comparatively early age, and became superintendent of Carlow Mental Hospital, a post which he held until his retirement in 1938. Dr. Greene's contribution to psychiatry was essentially in the realm of administration, and throughout his active career he was always many years ahead of his colleagues. Carlow Mental Hospital, with its beautifully laid out grounds and gardens—Greene was an expert gardener—and its pleasantly decorated wards, was always the showplace of provincial mental hospitals. Here Greene instituted occupational therapy and the wide use of parole long before either of these systems was generally adopted. The Royal Medico-Psychoiogical Association fully recognized Greene's contribution to psychiatry, and it was a keen disappointment to many of his colleagues that he felt obliged, purely for health reasons, to decline the highest honour which the association could bestow upon him. His great gifts of hospitality would undoubtedly have made his presidential year a memorable one. In the Irish division of the R.M.P.A. Greene was for many years an outstanding personality, and his chairmanship is still vividly remembered. His mental dexterity, ready wit, and somewhat unorthodox approach to what appeared to be difficult problems made each meeting at which he presided a mental tonic. Greene was a man of imposing presence. Well over six feet in height, and built in proportion, his physical dominance was matched by a mental dominance that to strangers was almost overwhelming. In manner he could be extremely brusque, especially if he detected any sham or pose, but this only made his word of praise, which he often gave generously to juniors, all the more appreciated. Even in retirement at his beautiful home in Co. Down, Dr. Greene's services were largely availed of, especially during the war years, when he gave freely of his time and energy to the training of A.R.P. personnel and to the Red Cross Nursing Association. To those intimate friends who realized his frail state of health this effort takes on a new meaning. The sympathy of all who knew Dr. Greene will be extended to his widow and his daughter.—R. T.

By the sudden and unexpected death of Mr. S. L. JACKSON on July 1 the firm of H. K. Lewis and Co. loses one of its directors, and Mr. H. L. Jackson, chairman for over thirty years, his only son. Mr. S. L. Jackson had many friends in the medical profession, and through his work for the Booksellers' Association was well known to many publishers as well as to booksellers. He served during the 1914–18 war in the West Yorkshire Regiment, and was acting captain at the time of his capture. He returned to the company early in 1919. He was in his fifty-second year.

Medico-Legal

NULLITY DECREE ON BLOOD-GROUP EVIDENCE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Blood grouping has not figured very prominently in matrimonial cases. Its chief field of legal usefulness is in cases in which a woman asks magistrates for an affiliation order on the ground that a named man is the father of her illegitimate child and the man denies paternity. In such a case a blood-group test will sometimes, if the man is really innocent, exclude him. The principle, broadly, is that the characters which determine a person's blood group are inherited as Mendelian dominants and therefore every character which a child possesses must have come from one of his parents. Ergo, if a child has a particular blood group which is not accounted for either by his mother or by the man who is said to be his father, another man must be looked for. There have been divorce cases in which a husband has won a decree by blood-group evidence which proved that a child borne by the wife could not have been his, and in at least one most interesting case a husband, summoned before the magistrate for failure to maintain his wife, has accused her of adultery on the basis of a test which excluded his paternity. In that case Mr. Claud Mullins took the bold step of going against a report by Dr. David Harley, although he was in general very receptive of scientific evidence and appreciated it with great understanding. In the end the parties were reconciled and the husband accepted the child as his own, and, let us hope, they lived happily ever after, but the champions of blood-grouping evidence, particularly in the United States, have never really forgiven either this *Journal* or its correspondent for agreeing with Mr. Mullins over that particular case.[1]

A recent nullity case was decided largely on blood-group evidence. By Herbert's Act—the Matrimonial Causes Act, 1937, Sect. 7 (1)—it was made a ground for a nullity decree that the wife was pregnant by another man at the time of celebration of the marriage if the husband did not know of the fact. In this case[2] the husband said that he had intercourse with the wife before marriage. This took place in June, 1945, and he married her in August; a full-term child was born in January, 1946. Blood-group tests (done, of course, with the consent of the wife) showed that the child's blood group was A but both spouses were in group O, and therefore the husband could not be the father. Lord Merriman, president of the Divorce Division, granted a decree on this evidence corroborated by other facts.

There was a similar case[3] in 1942 when a decree of nullity was granted to a young officer whose blood group was OM, while that of his wife was BM, and of her child ABN. In expert hands the tests are for all practical purposes infallible, and it is a pity that lack of knowledge and suitable legislation has prevented their extended use in England. In many other countries the courts have for years been only too glad of their help in a very difficult class of cases.

[1] *British Medical Journal*, 1944, **1**, 134.
[2] *Liff* v. *Liff*, 1948. *Weekly Notes*, p. 128.
[3] *British Medical Journal*, 1942, **1**, 776.

The Services

Lieutenant John McLenachan, R.A.M.C., has been awarded the George Medal in recognition of gallant conduct in carrying out hazardous work in a very brave manner.

Major-General Sir Ernest M. Cowell, K.B.E., C.B., D.S.O., T.D., K.H.S., has been appointed Honorary Colonel 44 (Home Counties) Infantry Division, R.A.M.C., T.A.

The following appointment and mentions in dispatches have been announced in recognition of distinguished services in Palestine:

O.B.E. (*Military Division*).—Acting Wing Commander R. A. Fleming, R.A.F.V.R.

Mentioned in Dispatches.—Acting Group Captain D. A. Wilson, R.A.F.; Squadron-Leader B. R. Little, R.A.F.V.R.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The honorary degree of D.L. is to be conferred on Thomas Benjamin Davie, M.D., F.R.C.P., Principal and Vice-Chancellor of the University of Cape Town.

On June 23 the degrees of M.B., B.Chir. were conferred, by proxy, on D. J. Morton.

D. Gairdner, D.M., and G. K. Harrison, M.D., have been recognized as Lecturers in the Faculty of Medicine.

UNIVERSITY OF LONDON

John Leonard D'Silva, D.Sc., Ph.D., M.B., B.S., M.R.C.P., has been appointed to the University Chair of Physiology tenable at London Hospital Medical College, from Oct. 1.

Charles Horace Gray, M.Sc., M.B., B.S., A.R.C.S., F.R.I.C., has been appointed to the University Chair of Chemical Pathology tenable at King's College Hospital Medical School, from April 1.

Henry Adolph Magnus, M.D., has been appointed to the University Chair of Morbid Anatomy tenable at King's College Hospital Medical School, from April 1.

Sir Francis Fraser, M.D., F.R.C.P., Director of the British Postgraduate Medical Federation, has been reappointed Deputy Vice-Chancellor of the University for the year 1948–9.

Reginald Stephen Stacey, M.D., has been appointed to the University Readership in Therapeutics tenable at St. Thomas's Hospital Medical School, from June 1. From 1932–5 he was first assistant to the professor of medicine at St. Thomas's Hospital and from 1935–47 he was professor of pharmacology and therapeutics in the Royal Faculty of Medicine of Iraq, Bagdad, and physician to the Royal Hospital, Bagdad.

Herbert Edmund Vincent, M.D., has resigned the post of Chief Invigilator of the University, an appointment he has held for the past 40 years. Dr. Vincent qualified M.R.C.S., L.R.C.P. in 1887 and took the London M.B., B.S. in the same year, proceeding M.D. in 1888.

The following representatives of the University on the governing bodies of the institution indicated in parentheses are announced: V. E. Negus, M.S., F.R.C.S. (Institute of Laryngology and Otology); L. V. Cargill, F.R.C.S. (King's College School, Wimbledon); C. E. Newman, M.D., F.R.C.P. (West London Hospital Medical School); Ruth E. Proctor, M.B., Ch.B. (Battersea Polytechnic Training College of Domestic Science).

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY.—*Part I:* F. A. Adcock, H. S. Ali, J. M. Burbury, D. McC. Gregg.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

The King's College Hospital Medical School announces the foundation of the Wiltshire Memorial Research Scholarship and the Legg Memorial Lecture.

The Wiltshire Memorial Research scholarship was founded this year to commemorate Harold Waterlow Wiltshire, D.S.O., O.B.E., M.A., M.D., F.R.C.P., Physician to King's College Hospital from 1910 to 1925, and its primary object is to encourage research in cardiology. The holder must be a registered medical practitioner and will be called the Wiltshire Memorial Research Scholar. The appointment will be made by the council of the school on the recommendation of a selection committee of five to be appointed by the council. The appointment, which is part-time, is tenable for one year but may be renewed annually on the recommendation of the selection committee. The honorarium is at the rate of £250 a year, payable quarterly, and the scholar will be expected to carry out research under the direction of the physician in charge of the cardiology department. Leave of absence will be granted for six weeks each year.

The Legg Memorial Lecture, also founded this year, is in memory of Thomas Percy Legg, C.M.G., M.S., F.R.C.S., Surgeon to King's College Hospital from 1910 to 1930, and will be given annually on a surgical subject on the invitation of the council of the medical school. The honorarium is the annual interest on £1,000 (at present about £25).

UNIVERSITY OF MANCHESTER

The Council of the University has appointed Edward William Anderson, M.D., F.R.C.P., D.P.M., at present physician to the Maudsley Hospital, London, Professor of Psychiatry and Director of the Department from a date to be arranged.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The following candidates have received the Diploma of Fellowship: G. I. Fenton, E. A. McGivern, S. N. Rutherford, E. F. Shanahan.

Medical Notes in Parliament

NATIONAL HEALTH SERVICE

Mr. BEVAN stated on July 8 that by July 5 well over 30 millions of the total civilian population of 42 millions in England and Wales had been accepted by doctors under the National Health Service Act. He said there was a flood of forms still in the hands of doctors and executive councils which had not been counted.

Dental Service

On July 8 Mr. LIPSON asked the Minister of Health whether, in view of the large number of dentists who had decided not to take part in the general dental service under the National Health Act, he would invite the Dental Consultative Committee to meet him again in order to try to find agreement on outstanding differences.

Mr. BEVAN said he would not do so. In his opinion the terms of service offered to dentists were generous and reasonable. He believed that most individual dentists would feel the same.

Mr. LIPSON then reminded Mr. Bevan of the happy result which had followed his gesture to the doctors. He asked whether the Minister would make a similar gesture to the dentists, so as to ensure that the benefits of the dental part of the Health Service reached the people at the earliest possible time.

Mr. BEVAN said he was convinced from the figures of the dentists joining up that very soon almost all dentists would be taking service under the Act. He added, "In any case we cannot submit to what may become, unless we are careful, blackmail."

Capitation Fee

Sir HENRY MORRIS-JONES asked how the amount of the capitation fee to medical practitioners under the National Health Act would be arrived at; what deductions came out of the 15s. 6d. per head; and how the amount for each area would be computed having regard to the proportion of the population who had not selected a doctor.

Mr. BEVAN said that detailed arrangements were still under discussion with the British Medical Association.

Sir HENRY reported that a large number of general medical practitioners were perturbed about this. They gravely feared their total emoluments would be considerably reduced below the pre-National Insurance income and they wished to know whether the total pool would be available to them.

Mr. BEVAN thought these doctors should await the result of discussions with representatives of the medical profession.

Hospital Boards and Committees

Sir IAN FRASER asked if regional and group hospital boards had power to co-opt extra members.

Mr. BEVAN replied that they had no such power, but regional hospital boards, hospital management committees, and boards of governors of teaching hospitals had power to appoint committees and subcommittees consisting partly of outside members and to delegate functions to them.

Mr. HEATHCOAT AMORY asked whether the Minister of Fuel and Power had authorized the granting of petrol allowances to members of the new hospital committees and boards on a scale sufficient to cover the requirements of this voluntary work.

Mr. ROBENS said adequate allowances would be made available, but, in common with all other supplementary allowances granted by the regional petroleum officers, the amount of the standard ration would be deducted if this had not already been done in respect of some other supplementary allowance issued for the same car.

Doctors and Patients under the Act

Mr. BOSSOM asked on July 2 whether Mr. Bevan before the National Health Service came into operation would ensure that lists of the doctors in the Service would be available in post offices and libraries so that patients could choose their doctor before July 5.

Mr. BEVAN said he had asked the executive councils to get these lists into the post offices on or as soon as possible after July 21. Some councils had already done so, but others, including London, had not yet succeeded although they would do so as soon as possible. Any member of the public in an area where a list had not appeared could apply to the executive council for names of doctors on the list in his neighbourhood.

Mr. BOSSOM said that he himself had had trouble to find a doctor. He went to a post office but was told to go to the library and look up the *Medical Register*. He took the first three names on the local list, but found that the first address was a bombed site and that the other two doctors had gone away.

Mr. BEVAN said he had always expected there would be inconvenience as a result of the tardiness of many doctors to sign on these lists. The official propaganda of the profession had told doctors there was no hurry to sign. The consequence had been a rush of doctors in the last few days which made it impossible for executive councils to complete the lists in time. Many local medical committees had asked those councils not to put up incomplete lists as to do so would be unfair to those doctors who had not yet signed. In many cases the delay was entirely due to the consequences of the propaganda of the medical profession. Mr. Bevan said that he refused to accept responsibility for it. On doctor's lists up to June 26, 7,500,000 patients had already signed and 20,000,000 on the panel were automatically transferred.

Mr. ASSHETON was sorry Mr. Bevan had put the blame on the doctors. The Opposition could not agree to that course. He asked where communications should be addressed in order to reach the executive councils.

Mr. BEVAN said the names of doctors and addresses of the executive councils were placed in post offices and public libraries and so were available. Part of the difficulty lay in classifying doctors in areas such as London, where 1,000 general practitioners were involved.

Major BEAMISH said there was no more public-spirited body than the doctors and it was unfair to put the whole blame for the delay on them. The cause for the delay was Mr. Bevan's obstinacy in the past.

Mr. BEVAN said he put no blame on individual doctors, but the present difficulty must have been expected when the profession's propaganda clashed with the instructions given by the Ministry of Health. The position was perfectly clear to the public. It was essential for the doctor to be on the list before July 5 but the public could join at any time after.

Mr. GALLACHER said the general opinion was that Mr. Bevan had been, if anything, too generous and considerate to the doctors. He asked him to show equal consideration for the Scottish chemists.

The Amending Bill

Sir HUGH LUCAS-TOOTH asked on July 1 when Mr. Bevan expected to receive the report of the Committee which had been set up to advise him on certain clauses in the National Health Service Act and when Mr. Bevan intended to introduce legislation giving effect to his undertaking so to amend the Act as to make it impossible to institute a full-time salaried medical service by regulation alone.

Mr. BEVAN said he hoped to receive this report by the end of September. Amending legislation to cover anything necessary in the light of the report, together with the point mentioned by Sir Hugh, would be introduced as soon as possible thereafter.

Sir HUGH LUCAS-TOOTH asked whether Mr. Bevan did not agree to the fact that the doctors were entering the Service before the settlement of the vexed question involved was an indication of their strong desire to give the Service a good start? He requested Mr. Bevan to give a definite undertaking that he would implement the recommendations of the Committee when in due course they became known, and that he would not increase the salary element before legislation was introduced?

Mr. BEVAN was glad to be able to say that despite the prophecies of certain pessimists the doctors were entering the Service in very large numbers, which was an indication of their confidence in the word of the Minister of Health. Before many years, or it might be months, Conservative members would claim credit for the Health Act, although they had voted against both the Second and Third Readings.

Mr. WALTER ELLIOT retorted that the Health Service was due to the proposals of the Coalition Government. Conservative votes had been directed to the elimination of certain features.

Mr. BEVAN said the fact was that the Opposition had been unable to secure the co-operation of the medical profession in any proposals.

TUBERCULOSIS IN SCOTLAND

In the Scottish Standing Committee on July 1 the estimates for the Department of Health, Scotland, and for the National Health Service, Scotland, were considered.

Mr. WALTER ELLIOT said he wished to discuss particularly the recent increase in tuberculosis in Scotland. Other important health questions would come up later. These would include the representations from doctors previously employed on the outdoor medical service of the Glasgow Corporation, who considered they had received scurvy treatment in the new Health Scheme. These men after twelve years' service and at an average age of 50 found themselves rather stranded on the coming into force of the new Act. He noted that in discussing Scottish health the Committee had no figures later than December, 1946, in the Report before it. The maternal mortality rate had continued to fall in 1947, but the infantile mortality rate had risen from 53.8 to 56. The tuberculosis rate had decisively changed for the worse. Deaths from tuberculosis in Scotland were the worst for twenty years, although figures for non-pulmonary tuberculosis continued to move in a satisfactory direction.

Deaths in Scotland from pulmonary tuberculosis in 1938 were 2,581. During the war the figures rose and fell again slightly, but in 1945 there were 2,932, in 1946 there were 3,231, and in 1947 there were 3,389. These figures contrasted with the general trend of tuberculosis throughout the world. The same trend was beginning to show in the industrial northern regions of England. In Scotland the death rate in 1946 was 64 per 100,000, a higher figure than any since before 1930. The so-called slump years, 1930–31–32 had figures of 63, 62, and 61. Notifications continued to rise. In 1945 notifications were 7,316; in 1947 there were 7,943. This compared with notifications in 1938 of 4,793. The Chief Medical Officer for Scotland had said there was probably no simple explanation of the increase, but Mr. Elliot contended that the rise demanded some further inquiry. He did not believe that 2,700 calories per person was adequate, and it might be that a scale of diet adequate for clerical occupations was not adequate for the heavy industries.

He mentioned the shortage of accommodation in sanatoria. This was not really a shortage of beds, but a shortage of staff. There was nearly a 50% deficiency of nurses in sanatoria and the isolation of infected cases was not taking place. It was rash for the Secretary for Scotland to push through everyone's letterbox a leaflet saying, "If you need it, you can have treatment in hospital either as an in-patient or as an out-patient." That pledge could not be implemented. For comparison, Mr. Elliot mentioned that the deaths from tuberculosis were falling in England as a whole, but were going up in Durham, Lancashire, and the West Riding, though not in the more agricultural counties of Cumberland and Northumberland. The increase was less well shown in Liverpool and Manchester and was not shown at all in Sheffield and Leeds. These figures required investigation and all the more so because an inquiry by the Medical Research Council at the instance of the Ministry of Health into tuberculosis in Germany reported that the rates for Hamburg were considerably less than those obtaining in Glasgow.

Government Reply

Mr. FRASER, replying for the Government, said the Scottish Health Report for 1947 had been in the hands of the printers for some time. Colonel Elliot had compared the present figures for deaths from pulmonary tuberculosis with those in the slump years, but this was a disease the germs of which might remain quiescent for ten years or more and then become active. It might be that the undernourishment of people in Scotland in the early 'thirties had something to do with the rise in tuberculosis notifications and deaths in the war years. Among young women in Scotland between 20 and 25 years of age who died from tuberculosis in recent years were persons who contracted the disease ten, fifteen, or more years ago. The same was true of men up to 45. The standard of nutrition in Scotland among industrial workers was comparable with that of such workers in England, and therefore the Committee had to look beyond nutritional standards for the cause of the continuing high incidence of tuberculosis in Scotland. It was true that the incidence in Hamburg was on a downward curve, but in Berlin and other parts of Germany a different story would be told. It was regrettable that they had got back to the 1920 level of notifications. Deaths, too, had increased, but not so markedly. The continuing increase in contrast with the increase during the war period was very nearly peculiar to Scotland. Mass radiography had discovered more than 1,000 cases in Scotland, but the death figures were the really important ones. Hospital accommodation for treatment was there if the nursing staffs were available. They had at present 2,324 sufferers on the waiting list in Scotland, compared with 771 in 1942. The number of beds occupied by tuberculous patients at the end of 1947 was 5,493, an increase of 277 during the year. In general hospitals and other hospitals more beds could be made available for these patients if there was the nursing staff. In December, 1946, 1,245 nurses were in sanatoria and the tuberculosis wards of infectious diseases hospitals. There was only a very small number of part-time nurses. By March 31, 1948, the whole-time staff had gone up to 1,318 and the part-time staff to 599. The estimated additional requirement for sanatoria and infectious diseases hospitals was 1,300. The overall shortage of nurses in Scotland was estimated to be about 5,000, although nearly 3,500 more wholetime nurses were employed in Scotland than before the war. Superintendents of sanatoria and general hospitals in Scotland agreed that the way to get nurses for tuberculosis work was not to isolate them and not to give hospitals over completely to the treatment of tuberculosis, so that there could be a frequent interchange of nurses between general wards and tuberculosis wards.

Col. HUTCHISON said the incidence of tuberculosis among nurses allotted exclusively to that work was lower than among nurses undertaking general hospital work, and that both had a lower incidence of tuberculosis than the same groups in outside life.

Mr. FRASER said he could not confirm this at the moment. The most important long-term remedy for tuberculosis was improved social conditions for the mass of the working people of Scotland.

Mr. JOHN HENDERSON said he was told by eminent medical men in Glasgow that of all branches of medical science the treatment of tuberculosis had made least progress during the last twenty-five years. Yet the Government had been responsible for almost the entire payment for this treatment, which was more or less carried out by the local authority on a policy laid down by the Government. That did not indicate a happy future for the nationalized medical service. He suggested that infection had been increased during the past winters by the keeping of the windows of houses closed because of the difficulty of getting sufficient heating.

B.C.G. and Streptomycin

Col. HUTCHISON doubted whether there was a valid argument in saying that cases which became apparent now could be traced back over ten years. There was a remarkably low rate of tuberculosis in Scandinavia, where B.C.G. immunization was being used. This did not prevent the disease but made resistance to it much stronger.

Mr. SCOLLAN testified that as a young man he had been cured of tuberculosis by a South African native root called "umckaloabo," brewed like tea and administered to the patient.

Sir BASIL NEVEN-SPENCE said that in Shetland the mortality rate was 104 per 100,000 as against an average county mortality rate in Scotland of 55. Yet bovine tuberculosis had been completely eradicated in Shetland. He was perfectly sure that in the Highlands and Islands the key to the problem was housing.

Mr. NIALL MACPHERSON spoke of mass radiography and said that at Edinburgh University the students had an annual check-up. Was it intended to do the same in schools and when men went to register for national service? It seemed to him necessary that miners should be examined periodically. The Scottish Estimates spoke of the purchase of streptomycin for research, but his information was that that drug was severely restricted in this country because, owing to the shortage of dollars, the Government was not prepared to purchase it. He believed that only one thoracic unit had been established in Scotland, at Mearnskirk. Were others being established?

Mr. WOODBURN said tuberculosis spread more easily under conditions of overcrowding, but it did not necessarily follow that overcrowding brought tuberculosis. The cause was probably not so much that people were overcrowded but that they developed certain habits of living too close together without fresh air. People stayed in the tenements and never came into the fresh air. Most of the tuberculosis in Western Scotland came from contacts with infected people. A good deal had still to be done in making improvements in order to get a greater recruitment of nurses. It seemed that Highland people were less immune if they came to Glasgow than the people who were born and bred there. Yet in the Highlands and in the Outer Isles people lived closely in their houses and shut out the fresh air. The Department of Health for Scotland was opening hospitals and trying to get better sanatoria. It was investigating B.C.G. immunization and streptomycin, but had to be careful about raising hopes until cures were certain. The Department might save many lives by sending the children of patients into residential educational centres and getting nurses to nurse the children even if they would not nurse the patient. The question of overcrowding and other matters could be discussed when the Committee came to the Health Estimates.

FACTORIES BILL

The debate on the second reading of the Factories Bill was resumed on July 2. Mr. PIRATIN, discussing the supervision of canteens in factories, pointed out that local sanitary inspectors had some responsibility for the supervision of kitchens, and asked the Minister to say in which way the two sets of inspectors would work together. The provision of washing facilities was one of the most abused sections of the existing Factories Act. It was not a matter of introducing new Clauses but primarily one of implementing them.

Mr. ASSHETON said it was now clear that the transfer of the duties of the factory inspectorate from the Home Office to the Ministry of Labour had proved to be successful. The department of factory inspection was a fine one and the men in it performed their duties to the satisfaction of both sides in industry.

Dr. MORGAN said the Government had brought in a National Health Service Act, and the complement to that should have been the introduction of an Industrial Medical Service Act. The trade union movement disapproved of the provisions in Clause 7 concerning examining surgeons. A doctor selected by employers or the industrial medical officer appointed by the employer in a factory would under the Bill have the option of being appointed as a factory doctor and would be able to undertake all the duties formerly imposed on the examining surgeon. This Bill enabled that doctor appointed by the employer to have the decision not only about the diagnosis in an individual case but on the fitness of a recruit for work. Representations had been made to the Minister by the Trade Union Congress to prevent this from happening. Dr. Morgan suggested that the Minister should take Parliamentary authority to say that the company's doctor should not usually be appointed as factory doctor but that the Minister on the advice of his inspectors and medical officers should have the right in particular cases to make this appointment. Dr. Morgan complained that there was no general industrial medical service and too few medical factory inspectors. There was no scheme for the appointment of medical officers for the smaller factories in which there were industrial risks. When the employer's doctor, who was also made the factory doctor, was to conduct examinations, who could guarantee the confidential relationship between the recruit to industry and the doctor? Who would guarantee that the records of the doctor would be kept secret? They would presumably be kept somewhere in the factory. In spite of these dangers the medical profession had not raised an objection to the risk of this confidential information being disclosed. If the Minister could do nothing else he could insist that permission must be obtained in cases where the employer's doctor would act for the employer against the man.

Major HAUGHTON said urgent representations had been made to him that there was a great shortage of protective clothing and that in consequence serious trouble arose in certain industries.

Mr. WEITZMAN was glad to see that in the provision of seating facilities the frailty of males was recognized. He could have wished that the opportunity had been taken in the Bill to prohibit or limit the conversion of dwelling-houses or parts of them into workrooms for small factories. It was necessary that the definition of "factory" should be extended. Injuries had occurred in technical colleges and in institutions which did not come within the definition of a factory.

Mr. SPARKS said a case could be made out for the establishment of an industrial medical service and the Bill did not go far enough in that direction. He thought that enough was not done to ensure that young people were advised to enter the kind of industry suited to their health and physique. A case could be made for bringing the railways within the scope of the Factory Acts.

Mr. ISAACS replied to the debate. He had a great deal of sympathy with Dr. Morgan's point about factory doctors, although he believed that a doctor who was the firm's doctor would not be swayed from his professional ideals. In moving the second reading he had given an undertaking to examine carefully any amendments which might be brought forward on the issue of certificates that diseases arose out of a man's employment. The Government did not wish to spoil the value of the factory doctor by having doubts cast upon his independence. He assured Dr. Morgan that he would not have introduced the Bill if it were likely to retard the coming into operation of a full industrial medical service.

The Bill was then read a second time.

Medical Examination of Prisoners

During the Report Stage of the Criminal Justice Bill in the House of Lords on June 29, on Clause 29, which concerns "Remand for inquiry into physical or mental condition," Lord BALFOUR OF BURLEIGH moved to leave out "physical or." He pointed out that in the 1939 draft of the Bill the Clause dealt only with mental cases. An assurance had then been given in the House of Commons by the Solicitor-General that no physical examination of common prostitutes was contemplated. He was alarmed because the inclusion of physical examination in the Bill was simultaneous with the new National Health plan, which involved changes in the whole service for treating venereal diseases. Some safeguard was needed against abuse. The Ministry of Health had issued a circular to local authorities stressing the importance of treating information about persons under treatment for V.D. as confidential "even though the revocation of the 1916 Regulations repeals the statutory requirement to this effect." Lord Balfour could not understand why the statutory requirement should have been repealed. What was to be the position of a medical officer of health when the

magistrate asked for the information? He would no longer have the statutory protection of secrecy. It might be that the divisional surgeon would have to give the information.

Lord CHORLEY said there was at present power to remand a person in order that an examination, whether physical or mental, might be made. In the past there had been prisoners who could not afford a medical examination at their own expense, and as a result the courts refused bail. The Clause gave opportunity to remand the man and for the court to see that the medical examination took place. In the case of prostitutes there was no alteration in the law, and the practice followed in the past would be followed in the future. That practice was never to submit them to a vaginal examination without their consent. Replying to Lord LLEWELLIN, Lord Chorley went on to say that the Government was unwilling to accept an amendment providing that no physical examination of a remanded prisoner should be made without consent. Under prison rules provision was made for examination. The provision for examination of women charged with soliciting was exactly the same as for any other person charged before the court. That prisons never subjected a woman to a vaginal examination without her consent was a well-understood principle, though not written into the prison rules. To that principle the Government intended to adhere.

The LORD CHANCELLOR said that if someone had only one lung it was relevant for the court to know that before deciding what punishment to give. The more intimate examination which had been mentioned had never been made and would not be made save with the consent of the prisoner.

Lord CALVERLEY said that in any large prison persons on remand could be found either in the verminous section or in the V.D. section.

Lord GODDARD said a physical examination was made of all young offenders who might be sent to Borstal.

Lord Balfour of Burleigh's amendment was negatived.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* increases in the number of notifications of scarlet fever 107 and acute poliomyelitis 12 were recorded, and decreases in whooping-cough 283, acute pneumonia 83, measles 53, dysentery 27, and diphtheria 21.

The rise in the incidence of scarlet fever was mainly confined to the midland counties: the largest increase was Lancashire 27. The decrease in the notifications of whooping-cough was general thoughout the country; the largest falls were Kent 77 and London 56. No large fluctuations were recorded in the local returns of acute pneumonia, and in most areas there was a small decline.

The trends of measles varied considerably. The largest decreases in notifications were Kent 106, Sussex 88, Derbyshire 84, and Middlesex 52; the largest increases were London 125, Monmouthshire 61, Yorkshire East Riding 59, and Hertfordshire 49. The largest local fluctuation in the trends of diphtheria was a decrease of 15 in Lancashire.

The returns of dysentery were the lowest for six months. The chief centres of infection were Lancashire 14, Yorkshire West Riding 13, and London 10. Notifications of acute poliomyelitis were the largest for eighteen weeks. The counties with more than one case of poliomyelitis were London 7 (Westminster 2, Woolwich 2); Yorkshire West Riding 5 (Darton U.D. 3); Middlesex 4 (Heston and Isleworth M.B. 3); Essex 2; and Cheshire 2.

In *Scotland* a decrease was recorded in the incidence of most infectious diseases, and the only exception was an increase of 20 in the notifications of scarlet fever. In the county of Lanark a decrease of 34 in the notifications of scarlet fever was reported. In Edinburgh the notifications of dysentery increased from 1 to 10. An outbreak of gastro-enteritis occurred in Paisley during the week and 7 infants have died.

In *Eire* an increase of 23 was reported in the notifications of diarrhoea and enteritis, while decreases were recorded for scarlet fever 22 and whooping-cough 19. Of the 46 cases of diarrhœa and enteritis 37 were notified in Dublin C.B. An outbreak of infective hepatitis involving 29 persons was notified from Tipperary, Slievardagh R.D.

In *Northern Ireland* the notifications of scarlet fever in the two county boroughs increased by 6, but a decrease of 11 was reported in the remainder of the country.

Week Ending July 3

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,532, whooping-cough 2,907, diphtheria 141, measles 8,987, acute pneumonia 359, cerebrospinal fever 42, acute poliomyelitis 36, dysentery 69, paratyphoid 6, and typhoid 6.

No. 26

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1948					1947 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	34	1	17	4	1	57	8	24	1	—
Deaths		—	2				—	—		
Diphtheria	137	17	44	6	1	182	15	47	31	5
Deaths	3	—	—	—	—	—	—	—	—	—
Dysentery	64	10	39	1	—	66	7	14	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	—	—	—	2	1	—	—	—
Deaths		—					—			
Erysipelas			21	9	1			31	7	—
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				46					56	
Deaths	33	1	11	2	—	76	3	18	4	4
Measles*	10,571	880	165	144	66	9,377	439	104	142	8
Deaths†			—	—	—	7	—	—	—	—
Ophthalmia neonatorum	47	9	11	—	—	62	6	12	—	1
Deaths										
Paratyphoid fever	8	1	2 (B)	—	—	10	—	1 (B)	1 (A)	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	373	19	1	14	—	342	20	3	—	3
Deaths (from influenza)‡	4	—	—	1	—	7	1	—	—	—
Pneumonia, primary			142	26				155	5	
Deaths	114	14		4	4		27		8	8
Polio-encephalitis, acute	4	1				11	2			
Deaths							1			
Poliomyelitis, acute	27	7	2	1	—	56	5	5	5	2
Deaths§	—	—					—			
Puerperal fever		2	12		—		3	13		—
Deaths										
Puerperal pyrexia‖	109	13	5	—	—	94	10	12	—	2
Deaths		—					1			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,649	103	394	40	36	947	69	110	25	31
Deaths†			1	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	2	—	—	—	—
Deaths				—	—	—			—	—
Typhoid fever	3	—	3	1	—	10	—	1	5	7
Deaths	1	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	2,803	217	38	86	12	2,052	188	78	73	5
Deaths	2	—	1	2	3	9	4	3	—	1
Deaths (0–1 year)	256	40	46	17	8	365	56	65	22	16
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,018	615	586	151	137	3,982	657	562	140	122
Annual death rate (per 1,000 persons living)			11·8	9·4				11·7	8·8	
Live births	7,743	1246	1015	448	246	9,012	1404	1096	459	265
Annual rate per 1,000 persons living			20·5	28·0				22·1	29·0	
Stillbirths	241	35	26			272	27	30		
Rate per 1,000 total births (including stillborn)			25					27		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

Medical News

Peckham Health Centre

Queen Mary, the Prime Minister, Sir Stafford Cripps, and other distinguished persons were present at the showing of a film produced by Mr. Paul Rotha on the Peckham Health Centre, and afterwards at the centre itself. The centre is an interesting experiment in the healthy use of community leisure, the family being the unit of membership of a club providing facilities for swimming, gymnastics, badminton, dancing, billiards, and so forth, and medical supervision and advice. The film has a certain pathos in showing the isolation of a family in the wilderness of houses that make up a "conurbation," but it fails to convey any idea of the experiment the directors of the centre are trying to carry out. The centre itself is so much better than the film that those who see only the latter are unlikely to be roused to enthusiasm. Whether any observations of real scientific value will emerge from the Peckham experiment remains to be seen. But there can be little doubt that similar centres —properly called "health"—in our large cities would do much to promote health and happiness among those who, through sheer density of population, must find it difficult to maintain the sense of belonging to a community.

Empire Medical Advisory Bureau

The Empire Medical Advisory Bureau set up by the British Medical Association was formally opened on the afternoon of Tuesday, July 13, by Lord Addison. Among the many distinguished guests present at the opening ceremony and at the sherry party which followed were representatives of the High Commissioners for Australia, Canada, New Zealand, India, Pakistan, Ceylon, and Southern Rhodesia. The Empire Medical Advisory Bureau is directed by Dr. H. A. Sandiford and is intended to assist in every way practitioners from the Dominions and Colonies who want to take advantage of the facilities available in this country for post-graduate study.

Entered N.H.S.

The Ministry of Health announces that 19,096 doctors in England and Wales had joined the National Health Service by July 5, and 2,245 in Scotland by July 3.

World Health Organization

On July 12 the Executive Board of the World Health Organization was elected by the World Health Assembly. Under the constitution one-third of the members retire each year, and it was therefore decided by drawing lots which States should serve for one year and which for two. Australia, Ceylon, the United Kingdom, United States, Norway, and Persia will serve for one year; Brazil, China, Mexico, France, Russia, and Egypt for two years; and White Russia, India, Poland, South Africa, the Netherlands, and Yugoslavia for three years. It had previously been unanimously decided that the headquarters of the World Health Organization should be in Geneva. This decision is subject to final confirmation by the General Assembly of the United Nations but is not likely to be opposed.

Whole-time Salaried Specialists

A special general meeting of the Association of Municipal Specialists was held on June 28 to discuss the future of the association under the National Health Service. It was unanimously agreed that the association should continue to serve whole-time medical specialists, and in future the association will be known as the Association of Whole-time Salaried Specialists. All whole-time specialists will be eligible for membership. Further information can be obtained from the office at 45, Lincoln's Inn Fields, W.C.2. (Telephone HOLborn 3474.)

Medical Photographers

A meeting of medical photographers was held at the Institute of British Photographers on June 11. Mr. L. J. Hibbert, Principal of the School of Photography, Polytechnic, Regent Street, and chairman of a committee of medical photographers, presented a report which the committee had prepared on the necessity for medical photography, its scope, the training and qualifications required, and the salaries that should be paid to qualified persons. The report will be submitted to the Ministry of Health. The meeting then agreed to start a register of medical photographers. It will be limited to members of the institute and those who have been in practice as medical photographers for not less than two years. The meeting concluded by deciding to form a medical group of the Institute of British Photographers, and its organizing committee was appointed.

Sir Alexander Fleming

At Canada House, London, on July 6 the High Commissioner for Canada presented Sir Alexander Fleming with the Gold Medal of the Canadian Pharmaceutical Society in recognition of his work for humanity in the discovery of penicillin.

Royal Medico-Psychological Association

The annual dinner of the Royal Medico-Psychological Association was held at the Café Royal on July 7, with the President, Dr. W. Rees Thomas, in the chair. There was a good attendance of members and their guests, and delegates from the U.S.A., Australia, France, Belgium, and India were present. The toast of the association was proposed by Mr. John P. Edwards, M.P., Parliamentary Secretary to the Ministry of Health, who referred to the help given by the association to the Ministry when the mental health side of the National Health Service was being planned. Mr. Edwards stressed the determination of the Ministry to remove mental hospitals for all time from their previous position of isolation. Dr. Rees Thomas, in his reply, said that psychological medicine was at a disadvantage compared with other branches of medicine because it was tied up with the law. Workers in this field were to some extent in the hands of the legislators, whose task it is to give conditions which would lead to sound mental health. On the clinical side he believed that progress would be hastened by a wide development of the out-patient clinic system. The toast of the guests, among whom were the Presidents of the Royal College of Physicians and the Royal College of Obstetricians and Gynaecologists, was proposed by Dr. R. Ström-Olsen. Miss D. M. Smith, Chairman of the General Nursing Council, in her reply, congratulated the association on its decision to hand to the statutory body the responsibility for conducting the examination of nurses who worked in mental hospitals. The toast of Medicine was proposed by the Bishop of Lincoln, and replied to by Dr. A. Pool. Both speakers, while by no means in favour of all forms of so-called faith healing, referred to the very real value of spiritual healing and welcomed the agreement which had been reached between the Council of the B.M.A. and the Churches' Council of Healing (see *Supplement*, Nov. 8, 1947, p. 112).

Cameron Prizewinner

After receiving the Cameron Prize in Edinburgh for his outstanding work on the effects of drugs on the thyroid gland, Professor E. B. Astwood, endocrinologist at the Pratt Diagnostic Hospital, in Boston, U.S.A., is in London until July 23 lecturing for the British Medical Association and visiting endocrinological departments under the auspices of the British Council.

Sickness Benefit

If a medical officer of health considers it advisable to exclude a person from work because he or she is under observation as a contact or carrier of infectious disease, he now has power, under Ministry of Health Circular No. 115/48, to issue a certificate which will enable the person concerned to claim sickness benefit from the Ministry of National Insurance.

Octogenarian

With its current number the *Practitioner* celebrates its 80th birthday since it was started in 1868 under the editorship of Dr. F. E. Anstie, of the Westminster Hospital, and Dr. H. Lawson, of St. Mary's. Sir Heneage Ogilvie reviews the changes that medicine has undergone since that time, from clinical impressions to statistical inquiry, from polypharmacy to a more precise therapy, from individualism to organization. Professor Ryle writes on one of medicine's newest branches—social medicine—and Dr. Leslie Banks, of the Ministry of Health, expounds the National Health Service Act.

Mr. R. W. Raven

Mr. R. W. Raven, O.B.E., F.R.C.S., has been elected a corresponding foreign member of the Roman Surgical Society.

Superintendents of Mental Hospitals and Institutions

Because the Lunacy Act, 1890, was repealed on July 5 and the Mental Deficiency Regulations, 1935, are being rewritten, the Minister of Health has made a regulation requiring the appointment of superintendents of mental hospitals or institutions for mental defectives administered by Regional Hospital Boards. The superintendent will normally be a medical practitioner; if a Board considers that an institution might have a lay superintendent it should inform the Minister of its views. The superintendent will be responsible for the general management of the hospital or institution subject to the direction of the Regional Hospital Board or hospital management committee, and he has power to suspend any officer.

Chevalier of the Legion of Honour

The President of the French Republic has conferred the decoration of Chevalier of the Legion of Honour upon Mr. C. Bowdler Henry, M.R.C.S., L.R.C.P., L.D.S., in recognition of services rendered during the war.

Brahan Convalescent Home of Perth Royal Infirmary

Speaking at the opening ceremony of the Brahan Convalescent Home of Perth Royal Infirmary on June 12, Sir Andrew Davidson, Chief Medical Officer, Department of Health for Scotland, said that we were on the eve of great new developments in the health services. The opening of that beautiful new convalescent home seemed to deny the contention that local interest and initiative were likely to disappear from the great national hospitals. Another misconception which it destroyed was that there was no place in the health services nowadays for voluntary effort. Never, in fact, had there been more need for service—in the true sense of the word—as in these days when the horizon of health effort was widening so rapidly. The administration of the National Health Service was built on voluntary service. In Scotland five Regional Hospital Boards and 25 local executive councils, all comprising voluntary members expert in various branches of the work, were already wrestling with problems of organization and administration of the National Health Service; the Central Health Services Council set up to advise the Secretary of State on all matters concerning the Service—also comprising experts giving voluntary service—had been constituted and had set to work; and the preventive services of local authorities were administered by health committees consisting of members giving freely of their time and energy.

Award of Scholarships

The following scholarships have been awarded at the Royal Free Hospital School of Medicine for the year 1948–9. *A. M. Bird Entrance Scholarship:* Miss S. J. R. Stockton, Queenswood School, Hatfield. *Mabel Sharman-Crawford Scholarship:* Miss J. E. Arnott, Shrewsbury High School. *Lieut. Edmund Lewis (R.A.F.) and Lieut. Alan Lewis (R.N.A.S.) Memorial Scholarship:* Miss M. C. Lewin, Royal Free Hospital School of Medicine. *A. M. Bird Scholarship for Clinical Studies:* Miss B. I. Bing, Royal Free Hospital School of Medicine. *Sir Owen Roberts Memorial Scholarship:* Miss M. W. Sturges, Royal Free Hospital School of Medicine.

Wills

Sir Henry Lindo Ferguson, of Dunedin, New Zealand, left estate in England valued at £8,490 12s. 8d. He left £1,000 to the New Zealand Medical Benevolent Fund to provide annuities for aged and incapacitated medical men and their widows. Dr. James Herbert Wright, formerly M.O.H. for Sutton Coldfield, left £13,431; Dr. Edward Deanesley left £42,265; Dr. John Duncan McVean left £22,909; and Dr. Egerton Allen Ferguson, of Salford, left £8,806.

COMING EVENTS

British Standards Institution

The annual general meeting of the British Standards Institution will be held on Wednesday, July 21, at 3 p.m., at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2.

Royal Institute of Public Health and Hygiene

The president and council of the Royal Institute of Public Health and Hygiene will give a reception to the Empire delegates to the International Congress on Physical Education, Recreation, and Rehabilitation at the institute (28, Portland Place, London, W.) on Thursday, July 22, at 6 p.m., when the guests will be received by the president, the Rt. Hon. Walter Elliot, *M.C.*, F.R.C.P., F.R.S., M.P.

Biochemical Society

The 268th Meeting of the Biochemical Society will be held at the Biochemical Department, the University, Glasgow, on Friday and Saturday, July 23 and 24, starting each day at 11.15 a.m.

Edinburgh Lectures

In connexion with the postgraduate course in medical sciences which began on July 5 a series of open lectures has been arranged by the Edinburgh Postgraduate Board for Medicine to be given in the anatomy lecture theatre of the University of Edinburgh. On July 12 Professor A. C. Frazer spoke on "Fat Digestion and Absorption" and on July 15 Sir Jack Drummond, F.R.S., discussed "The Practical Significance of Wartime Experience in the Field of Nutrition." The remaining lectures will be announced in the diary column of the *Journal* week by week. All graduates and students are invited to attend the lectures.

SOCIETIES AND LECTURES

Wednesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At Anatomy Lecture Theatre, Edinburgh University, July 21, 3.30 p.m. "*Blood Flow Through Extremities*," by Prof. H. Barcroft.

Thursday

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—July 22, 5 p.m. "*The Changes in Volume and Distribution of Body Water under Conditions of Stress*," Bernhard Baron Lecture by Prof. John Beattie.

Friday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At Anatomy Lecture Theatre, Edinburgh University, July 23, 4.30 p.m. "*The Neutral 17-Ketosteroids*," by Professor G. F. Marrian.

Saturday

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, London, W., July 24, 2.30 p.m. Annual general meeting. Election of officers, etc. "*The Pathology of Gonorrhoea*," Address by the President, Dr. A. H. Harkness.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crawford.—On July 1, 1948, at Edgbaston Maternity Nursing Home, Birmingham, to Mary (née Seton), wife of W. Cowan Crawford, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., a daughter.

Crockett.—On July 9, 1948, at Lansdowne House, Lansdowne Road, London, W., to Joan and Dr. Gerard Crockett, a son.

Devlin.—On June 27, 1948, to Dr. Audrey (née Conyngham) and Dr. H. R. T. Devlin, 18a, Woodlane, Falmouth, Cornwall, a daughter—Melian.

Dobson.—On July 6, 1948, at Tan-y-Bryn, Imperial Road, Matlock, to Mary Belle, wife of Dr. R. B. Dobson, of Matlock, a daughter.

Griffiths.—On June 12, 1948, at Kidderminster, to "Fifi" (née Gurdon, Q.A.R.N.N.S.), wife of Dr. P. D. Griffiths, a daughter.

Jeanes.—On July 1, 1948, at Woolwich War Memorial Hospital, to Joyce (née Johnson), wife of Dr. C. W. L. Jeanes, a son—David Lloyd.

McDonald.—On July 3, 1948, at 9, Grosvenor Street, Edinburgh, to Margaret, wife of Surgeon-Lieutenant R. S. McDonald, a daughter.

Marsh.—On July 1, 1948, to Bobbie (née Robinson), wife of Dr. Alan Marsh, 3, Clanricarde Gardens, Tunbridge Wells, a brother for Susan—Michael Rupert.

Mitchell.—On July 7, 1948, at Dudley Road Hospital, Birmingham, to Elsie, wife of Gardiner Mitchell, F.R.C.S.Ed., twin sons.

Tabbush.—On July 1, 1948, at St. Chad's Hospital, Hagley Road, Birmingham, to Anne Jacqueline, wife of Dr. Henry Tabbush, a son—Paul Martin.

Watson-Jones.—To Ann and Dr. K. Watson-Jones, of Sheldon, Birmingham, a daughter.

MARRIAGE

Marsden—Coope.—On July 3, 1948, at St. Augustine's Church, Penarth, Henry Basil Marsden, M.B., Ch.B., to Pamela Jill Coope, M.A., B.Chir., by the Rev. G. H. A. Stephens, M.A.

DEATHS

Alexander.—On June 30, 1948, David Alfred Alexander, M.B., Ch.B., of 112, Pembroke Road, Clifton, Bristol.

Bidwell.—On July 4, 1948, at Bloemfontein, South Africa, Charles Hugh Bidwell, M.R.C.S., L.R.C.P., aged 76.

Cookson.—On July 7, 1948, at Heatherdown, Blagdon, Somerset, Reginald George Francis Cookson, L.R.C.P.&S.I.&L.M, of Clifton, Bristol.

Crawford.—On July 8, 1948, Herbert de Lisle Crawford, M.D., M.Ch., F.R.C.S.I., of 60, Russell Square, London, W.C., son of the late Rev. William Crawford, Dublin.

Davis.—On July 5, 1948, at 70, Brighton Road, Worthing, Everard Inseal Davis, M.R.C.S., L.R.C.P., aged 74.

Douglas-Webster.—On July 2, 1948, in South Africa, Edgar Maurice Douglas-Webster, L.R.C.P.&S.Ed., L.R.F.P.S.Glas.

Forbes.—On July 8, 1948, at Rochester, John Turnbull Thomson Forbes, M.R.C.S., L.R.C.P., Wing Commander R.A.F.M.S., retired.

Green.—On July 5, 1948, at 266, Stockport Road, Manchester, Edwin Alan Thomas Green, M.C., M.R.C.S., L.R.C.P., L.D.S.

Greene.—On June 26, 1948, at Killyleagh, Co. Down, Thomas Adrian Greene, L.R.C.P.&S.I.&L.M., J.P.

Jacobs.—On July 5, 1948, Lawrence Jacobs, M.B., Ch.B., of 43, Circus Road, St. John's Wood, N.W.

Kitchen.—On July 4, 1948, Harold Ernest Kitchen, B.A., M.R.C.S., L.R.C.P., of 4, Auckland Terrace, Ramsey, Isle of Man, aged 71.

MacArthur.—On July 5, 1948, at Glasgow Royal Infirmary, Duncan S. M. MacArthur, M.B., Ch.B.

McClenehan.—On June 30, 1948, at 14, Shanslieve Drive, Newcastle, Co. Down, James Martin McClenehan, M.B., B.Ch., B.A.O., D.P.H.

Pepper.—On July 9, 1948, Charles Edward Pepper, M.B., Ch.B.Ed., of 4, Park Hill Road, Croydon, aged 71.

Simon.—On July 1, 1948, Ewald James Simon, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., of 12, Bewick Road, Gateshead, aged 56.

Smith.—On July 10, 1948, Hugh Bernard Willoughby Smith, F.R.C.S., of Gainsborough, Lincs, aged 68

Symons.—At Church Crookham, Hants, Sir Thomas Henry Symons, K.B.E., C.S.I., K.H.S., M.R.C.S., L.R.C.P., Major-General, I.M.S., retired. Late Director-General, I.M.S., aged 76.

Wright.—On June 27, 1948, Stanley Ninian Wright, M.Sc., M.B., Ch.B., D.P.H., of Ravella, Upland Road, Spital Park, Bromborough, aged 58.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Adenosine in Angina of Effort

Q.—*Adenosine and adenosine phosphate are reported to relax smooth muscle, dilate the coronary arteries, and cause a fall in blood pressure. In addition they slow the heart, presumably thereby reducing its oxygen requirements. Have these drugs ever been used in angina of effort? Possibly the increased coronary diameter would be offset by the decreased aortic pressure. Could adenosine then be used with ephedrine or adrenaline?*

A.—There does not appear to be any reference to adenosine or adenosine phosphate as a therapeutic agent for angina of effort. In 1929 Drury and Szent-Györgyi isolated adenylic acid, a closely related compound, from cardiac muscle. Adenosine phosphate is present in all muscle and plays an important part in its metabolism. Many drugs with an effect on the heart—for example, "padutin" and "lacarnol"—contain a certain amount of adenosine, and their action probably depends on this.

Much experimental work on heart preparations, uterine muscle, and living animals has been done, especially by A. M. Wedd (*J. Pharmacol.*, 1933, **47**, 365). Given intravenously adenosine decreases the rate of the heart and causes dilatation of the coronary and peripheral vessels; there is also a paralytic action on unstriated muscle tissue which lasts only a short time. In man, adenosine given intravenously results in a heaviness in the chest; breathing is increased in depth and frequency, and there is a sensation of heat in the head and body generally. A momentary rise in pulse rate is followed by a bradycardia, depending in degree on the dose of drug used. The PR interval is prolonged, Wenckebach phenomena occur, and heart-block ensues. The T wave is lowered. These changes are induced more easily if cardiac defects already exist. Kalaja (*Acta med. scand.*, 1938, Suppl., **89**, 239) reports the treatment of a case of paroxysmal tachycardia; his results were not convincing. He refers to two similar cases successfully treated by Jagachis in 1933. Experimentally produced auricular fibrillation has been successfully treated with adenosine.

Structurally related drugs are theophylline and theobromine; these have the advantage of being effective by mouth. The action of adenosine on the coronary vessels takes place in the presence of "mecholyl," "pitressin," and barium, which normally diminish the coronary blood flow. There is no reason why it should not be tried intravenously in the correct dosage for angina of effort. One would hesitate to use adrenaline or ephedrine in an attack of angina of effort because of the danger of inducing ventricular fibrillation.

Idiopathic Cheiropompholyx

Q.—*Is idiopathic cheiropompholyx always due to an external irritant? If not, can it be due to the ingestion of some antigen to which the patient is sensitive—for example, an antigen in eggs or egg powder? Are any vitamins of use in preventing attacks? Would stilboestrol help a woman of 67 in preventing attacks? What can be done to cure this distressing complaint?*

A.—Idiopathic cheiropompholyx is a constitutional affection of emotional and nervous origin. It is associated with hyperidrosis and often with an anxiety state, though hot weather predisposes to the eruption. The condition can be evoked upon occasion by contact with external irritants, more particularly with substances to which the patient is sensitized. It can upon occasion arise as an "ide" reaction, usually secondary to ringworm infection of the feet. It can also be simulated by a small pattern of toxic erythema limited to hands or hands and feet and due to the ingestion of foods or drugs, or to toxins, to which the patient has become sensitized. Eggs are not a very likely cause of the eruption, and vitamins have no particular prophylactic value, though on general grounds vitamin B therapy is of value in neurodermatitis.

In a woman of 67 a careful general overhaul would be necessary, and it is unlikely that stilboestrol would be indicated in treatment. In the absence of any organic factor the emotional state should be given attention, and symptomatic relief might result from the taking of phenobarbitone in small doses, from fractional doses of superficial *x*-ray therapy, and from bland local applications such as calamine liniment.

Sulphonamides and Agranulocytosis

Q.—(*a*) *Is the simultaneous administration of barbiturates and sulphonamides more likely to induce agranulocytosis than the use of the latter alone?* (*b*) *Is the administration of pyridoxin with sulphonamides used in preventing agranulocytosis?*

A.—(*a*) There is no evidence that this is so. On the other hand, a sedative which should never be given during sulphonamide treatment is amidopyrine. (*b*) Pyridoxin has been used successfully in preventing granulocytopenia during treatment with thiouracil. If there is no information about such an effect during sulphonamide treatment (and apparently there is not) it is because sulphonamides so rarely affect the bone marrow that proof of efficacy in this connexion would be hard to obtain.

Hypersensitiveness to Wasp Stings

Q.—*I have a friend who lives in dread of wasps. He was first stung at the age of 16, when a finger was attacked and the whole hand became swollen and painful for hours. The second time, when he was about 25, he was stung on the back of the hand; his whole arm swelled and his speech was blurred. The third time his lips and eyes closed almost immediately and he was unconscious for twenty minutes. He was then 35. Can he be successfully desensitized?*

A.—Extreme hypersensitiveness to the stings of wasps and bees can be eliminated, usually for a period of years, by a series of specific injections. Few successful cases have been recorded in the literature, but details can be obtained from the classical work of Benson (*J. Allergy*, 1929, **1**, 105; *Arch. intern. Med.*, 1939, **64**, 1306).

Angina Pectoris

Q.—*Is spa treatment, either in this country or abroad, of any value in the treatment of angina pectoris which has not responded to prolonged rest and routine treatment?*

A.—If adequate treatment and rest at home have failed to achieve any improvement in a case of angina pectoris it is doubtful whether spa treatment anywhere will produce any good result. The travel and excitement might in fact do harm. On the other hand, emotional circumstances at home may induce attacks which can be relieved by an enforced holiday away from home, and this may also effect complete severance of the patient from preoccupation with business affairs. Moreover, where there is a strong higher centre element, and when reduction of weight is part of the treatment, the quiet and ordered calm and regime of a well-managed spa may secure results which could not be expected in the home environment.

Children Travelling to the Congo

Q.—*What are the risks and what prophylactic treatment would you advise in the case of two children, aged 4 months and 2¼ years, whose parents contemplate taking them to the Congo at an early date? Is malaria likely in children so young?*

A.—Children in the Tropics may be exposed to the ordinary risks of infectious disease, such as diphtheria, against which it is always advisable to immunize children, while in addition they may be exposed to more specifically tropical infections. Children going to the Congo should be vaccinated against smallpox and inoculated against the enteric fevers and yellow fever. Malaria is quite likely in young children, therefore they should be protected so far as is possible against the bites of mosquitoes by the use of mosquito nets, and they should also be given some suppressive antimalarial drug; in the case

of children aged 4 months and 2½ years, 10 and 20 mg. of paludrine respectively every other day would probably be suitable suppressive treatment. If they are in a heavily infected sleeping sickness area the question of chemoprophylaxis by pentamidine might be considered.

Yellow Fever in 1865

Q.—*How did the outbreak of yellow fever at Swansea in 1865 occur, since the disease is spread by a type of mosquito not known in this country and the fever is not infectious man to man?*

A.—Once an *Aëdes* mosquito becomes infected with yellow fever it remains infective for the rest of its life. The outbreak at Swansea in 1865 was due to mosquitoes brought by the *Hecla* from Cuba. These mosquitoes were either already infected in Cuba or were infected from infected members of the ship's crew.

Glucose Injected Intravenously

Q.—*What is the fate of glucose injected intravenously? How and where does the body use it?*

A.—When glucose is injected into the blood stream it may cause a considerable rise in the blood sugar. If the latter is greater than 180 mg. per 100 ml., the usual level of the threshold, some glucose will be excreted in the urine and lost. The glucose which remains in the blood will be taken up by the muscles and liver and laid down as glycogen. It is not possible to say how much is taken up by each of these two depots.

Normal Blood Pressure

Q.—*What is the normal blood pressure in a healthy man aged 55? What variation can there be within normal limits?*

A.—A great deal depends on the circumstances under which the blood pressure is taken. When the patient is at home and at rest, and he knows the physician, basal readings will be obtained. Casual estimations under other circumstances will show considerably higher readings in the same patient. The normal basal blood pressure readings for an adult are usually taken to be between 105 and 145 mm. Hg systolic, and 60 and 90 mm. diastolic. Age plays only a slight part in determining blood pressure, which tends to rise slowly with advancing years. The upper limit for a normal man of 55 would be 155 mm. systolic.

Insect Bites

Q.—*What is the nature of the irritant injected by midges and clegs? What is the most effective antidote?*

A.—The irritation caused by the bites of midges and clegs is presumably due to the injection of their saliva, which usually causes irritation with blood-sucking insects. Little is known about the constitution of insect salivary juice, so that no specific remedies can be given. The secretion commonly contains foreign protein and may elicit an allergic response, so that the effects of bites vary widely in different people. Treatment can only be symptomatic.

Mechanical Aids for Incontinence

Q.—*Would any mechanical contrivance help the distressing incontinence in a case of tuberculous cystitis?*

A.—Incontinence is not a usual complication of tuberculous cystitis, although frequency of micturition may be so great in the advanced stages of the disease as to simulate true incontinence. The only mechanical contrivance which such a patient could wear is a rubber urinal. This is an awkward and uncomfortable appliance, and many patients prefer a towel.

Macrocytic Anaemia in Eunuchs

Q.—*Can you give particulars of a form of macrocytic anaemia occurring in eunuchs which responds to treatment with testosterone?*

A.—Experimental castration or hypophysectomy in rats leads to a fall in the red cell count and in the percentage of reticulocytes. Testosterone restores the latter, there being an immediate brisk reticulocytosis. Recently Watkinson and others (*Lancet*, 1947, **1**, 631) described two males with the Snapper–Witts syndrome (hypogonadism, alopecia, and anaemia associated with hypopituitarism. In one case a macrocytic anaemia failed to respond to liver, and in the other a microcytic hypochromic anaemia failed to respond to liver or iron; nevertheless both responded to testosterone. In the former the testosterone was effective alone; in the latter the testosterone was effective only when given with iron.

Nystagmus and Albinism

Q.—*A child aged 2 has had nystagmus from birth, due to albinism. Strabismus and refractive errors have been corrected by glasses with tinted lenses since the age of 9 months. What treatment should now be given for these two conditions, and what is the prognosis?*

A.—It is not uncommon for albinos to show physical defects other than lack of pigment. Nystagmus is, however, a constant feature in total albinism, and is believed to be secondary to maldevelopment of the maculae. The squint is likely to remain controlled by glasses. The nystagmus must be regarded as permanent.

Intrathecal Penicillin

Q.—*What are the indications for administering intrathecal penicillin, and what precautions are necessary to prevent possible complications?*

A.—The indication for the intrathecal administration of penicillin is meningitis due to an organism sensitive to penicillin but insensitive to the sulphonamide drugs. Meningeal infection by pyogenic cocci is thus the usual reason for such treatment. It is inadvisable to exceed an intrathecal dosage of 20,000 units daily; as there is danger of causing convulsions and a sudden increase in intracranial pressure. The most serious sequel of repeated intrathecal injections is secondary meningeal infection by such organisms as *Str. viridans*, *Ps. aeruginosa*, and coliforms which resist all forms of antibacterial treatment. Scrupulous asepsis alone avoids such complications.

NOTES AND COMMENTS

Apparatus for Mounting Stairs.—Dr. T. PEARSE WILLIAMS, London, W.1, writes: I wonder if one of your readers could advise me whether there is any apparatus devised which would enable a patient with almost complete ankylosis at the knee joints and very deficient movement at the hips to mount stairs which have a double right-angled bend two-thirds of the way up. To construct a lift would be a complicated business and very expensive.

Joseph Thomas Digby.—Professor JOHN BOSTOCK of the Department of Medical Psychology, University of Queensland, Brisbane, writes: I have been engaged in writing the history of Australian psychiatry prior to 1850. In this connexion a Mr. Joseph Thomas Digby and his wife left England in 1837 from St. Luke's Hospital to become the first superintendent and matron of the newly erected Tarban Creek Asylum in New South Wales, Australia. Having finished their work in 1850, they were said to have left for England about 1851. We have no record of their life prior to their leaving England or after their departure from Australia. Mr. Digby did yeoman work in psychiatry, and it would be greatly appreciated if any reader could give me any information concerning his life before and after his stay in Australia.

Corrections

There was one omission in the article on "Ministers of Health" which appeared in the *Journal* of July 3 (p. 41). Sir A. S. T. Griffith-Boscawen was Minister of Health from October, 1922, to March, 1923.

In the leading article on the Prophit Survey (June 19, p. 1189) it was stated that the work was carried out by three Prophit scholars—Dr. Ridehalgh, Dr. Daniels, and Dr. Springett. These workers were, in fact, the authors of the report "Tuberculosis in Young Adults," but it was not made clear that the results of work done by the fourth Prophit scholar, Dr. I. M. Hall, were included in the report.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.
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